117

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1931

No. 722

UTAH POWER AND LIGHT COMPANY, APPELLANT,

vs.

EMMITT PFOST, COMMISSIONER OF LAW ENFORCEMENT OF THE STATE OF IDAHO, ET AL.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF IDAHO

FILED FEBRUARY 23, 1932

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INDEX

	Original	Print
Record from district court of the United States, District of Idaho	3	1
Bill of complaint	3	1
Exhibit "A"—An act levying a license tax on electricity, etc.	16	16
Application for interlocutory injunction (omitted in printing)	20	
Subpœna (omitted in printing)	23	
Notice of hearing (" " ")	24	
Marshal's returns (" " ")	26a	
Motion to dismiss	27	21
Minute entry of hearing (omitted in printing)	32	
Opinion, Cavanah, J.	33	24
Order granting application for interlocutory injunction.	50	38
Interlocutory injunction (omitted in printing)	51	
Stipulation re amended answer	54	38
Amended answer	56	39
Opinion, Cavanah, J.	80	56

JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., FEBRUARY 20, 1932

	Original	Print
Motion of plaintiff to make and enter findings of fact and conclusions of law	90	64
Order denying motion of plaintiff for findings of fact and conclusions of law	110	80
Plaintiff's exceptions to refusal of court to make findings of fact and conclusions of law, etc.	111	80
Order allowing plaintiff's exceptions	127	83
Findings of fact and conclusions of law	128	84
Decree	146	95
Supersedeas order.....(omitted in printing)	148	
Statement of evidence	150	96
Stipulation re original answer	151	97
Affidavit of Fred E. Lukens	154	99
Stipulation re Exhibit "A"	157½	104
Exhibit "B"—Letter from Emmitt Frost to Geo. B. Thomas	158	105
Testimony of Robert A. Milliken	163	109
Irving Langmuir	178	122
Markham Cheever	199	142
J. A. Hale	212	154
Exhibit "C"—Map showing territory served, etc.	213	156a
Exhibit—Statement of operating data	217	160
Testimony of G. M. Gadsby	235	176
Exhibit "D"—Contract for electric power	235	176
Testimony of Frank W. Peek	241	182
Exhibit—License and certificate of water right	260	198
Testimony of Carl E. Magnusson	262	199
Testimony of Wellington Rapp	272	209
Stipulation re statement of evidence	279	215
Order settling statement of evidence	279	215
Petition for appeal	280	216
Assignments of error and prayer for reversal	281	217
Order allowing appeal	302	235
Bond on appeal and supersedeas (omitted in printing)	304	
Citation and service.....(omitted in printing)	306	
Stipulation in lieu of præcipe	308	236
Clerk's certificate.....(omitted in printing)	311	
Statement of points to be relied upon and designation of parts of record to be printed	312	238

[fols. 1-3] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT FOR THE DISTRICT OF IDAHO, SOUTHERN DIVISION

In Equity. No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff

against

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and FRED J. BABCOCK, Attorney General of the State of Idaho, Defendants

BILL OF COMPLAINT—Filed June 15, 1931

To the Honorable the Judges of the District Court of the United States for the District of Idaho; Southern Division:

Utah Power & Light Company, a corporation duly organized and existing under the laws of the State of Maine, and a citizen and resident of said State, files its Bill of Complaint against the above named defendants, whose citizenship and residence are hereinafter particularly alleged, and thereupon complains and says:

1. The plaintiff Utah Power & Light Company is a corporation duly organized and existing under the laws of the State of Maine, and a citizen and resident of said State, with its principal place of business and residence at Augusta, Kennebec County, in the said State of Maine, but doing business in the States of Idaho, Utah and Wyoming under and by virtue of compliance with the laws of each of such States, having filed certified copies of its Articles of Incorporation, and designated its statutory agents in each of said States in accordance with the laws thereof. The principal place of business of said plaintiff in Idaho is at Idaho Falls, Bonneville County, and the business of plaintiff in the States of Idaho, Utah and Wyoming is that of generating, transmitting and distributing electric power and energy as a public utility for barter, sale and exchange to users or consumers thereof in each of such States, and in interstate commerce between said States.

2. The defendant Emmitt Pfost is the legally appointed, qualified and acting Commissioner of Law Enforcement of [fol. 4] the State of Idaho and is hereinafter referred to as "Commissioner", and the defendant Fred J. Babcock is the legally elected, qualified and acting Attorney General of the State of Idaho and is hereinafter referred to as "Attorney General". Each of said defendants is a citizen of the State of Idaho and a resident of the Southern Division of Idaho.

3. This suit is a civil suit in equity; the matter in controversy herein exceeds, exclusive of interest and costs, the sum or value of $3,000, and arises under the Constitution of the United States, and is between citizens of different States.

4. The Extraordinary Session of the Legislature of the State of Idaho, convened on the 6th day of March, 1931, and adjourned sine die on the 13th day of March, 1931, and at said Session enacted an act entitled "An Act levying a license tax of one half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange; and providing for the collection and distribution of such tax; and for forms and procedure to be used and followed; requiring reports of the production of electricity and electrical energy and the furnishing of equipment for measuring same; prescribing penalties for violation of this act; exempting from such license tax the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho and providing that such exemptions shall accrue to the benefit of the consumer of such electricity and electrical energy; prescribing the duties of the State Commissioner of Law Enforcement under this Act, requiring him to give a bond for the faithful performance of said duties and fixing the amount thereof, and making an appropriation with which to carry out its purposes", which said Act received the approval of the Governor of the State of Idaho on March 17, 1931, and became Chapter 3 of the Laws of said Session. A copy of said Act, marked "Exhibit A", is attached to and made a part of this Bill of Complaint, and is hereinafter referred to as "Tax Act". The said defendant Commissioner is charged with the ad-

ministration, and he and the said defendant Attorney General are charged with the enforcement of said Tax Act.

5. The defendant Commissioner, acting under the authority of said Tax Act, has prescribed and prepared, or will forthwith prescribe and prepare, and will furnish to plaintiff, forms of statement for tax returns thereunder, and plaintiff prays leave to exhibit said forms when same are furnished. The Commissioner in and by said forms aforesaid, has construed and will construe said Tax Act to impose a tax based on all electricity generated or produced within the State of Idaho, and not solely upon electricity generated or produced for barter, sale or exchange, and to impose a tax upon all such electricity, including that generated or produced in interstate commerce.

[fol. 5] 6. The Commissioner has notified plaintiff that it is subject to the taxes imposed by said Tax Act, that it must comply with all the terms thereof and make a statement under oath, as provided therein, of all kilowatt hours of electricity generated, manufactured or produced by it in the State of Idaho for the calendar month of June, 1931, and for each calendar month thereafter, that such return must be filed and said tax must be paid on or before the 15th day of July, 1931, and thereafter on or before the 15th day of each succeeding calendar month, and that the Commissioner intends, if the plaintiff should fail to file such statement within the time prescribed by said Tax Act, to compute the taxes apparently due, and ascertain and assess against the plaintiff the tax provided by said Tax Act in respect of all electricity generated, manufactured or produced by plaintiff within the State of Idaho. Said Tax Act purports to authorize said Commissioner to inspect the books and records of the plaintiff.

7. Unless plaintiff files such statement and pays said tax on or before July 15, 1931, and monthly thereafter, defendant Commissioner, pursuant to his apparent duty under said Tax Act, will thereupon sue to collect such tax with a penalty of three times the amount of the tax alleged to be due, and will seek to enjoin plaintiff from generating or producing electricity within the State of Idaho while such tax remains delinquent, and that it is the intention of the defendant Attorney General, and it is by law made his duty, to bring

such suits against plaintiff upon request of defendant Commissioner. Plaintiff is informed and believes that such Tax Act, and the tax thereby sought to be levied and collected and the penalties and injunctive process thereby imposed and authorized, are unlawful and void, and in violation of the Constitution of the United Sates and of the Constitution of the State of Idaho, for the reasons hereinafter stated.

8. Plaintiff owns and operates an interconnected electric power system consisting of generating stations, transmission and distribution lines and other electrical equipment located in the States of Idaho, Utah and Wyoming, whereby energy in the electrical form is generated, transmitted, distributed and delivered in barter, sale and exchange, to its customers in each of said States, including, but not limited to, persons, firms, corporations, and irrigation districts, pumping water by electricity for irrigation purposes, to be used on lands in the State of Idaho, and in interstate commerce between said States of Idaho, Utah and Wyoming. As a part of said interconnected system, plaintiff owns and operates several hydroelectric stations located in the State of Idaho; among others certain stations on the Bear River known as Soda, Grace, Cove and Oneida, to which specific reference is hereinafter made.

During the year 1930, there was generated or produced on and by that part of said system located in Idaho, in conjunction with said interconnected system, electricity measured through integrating watt-hour recording meters in terms of 236,601,000 kilowatt hours.

[fol. 6] Of said electircity so generated or produced by plaintiff, the following was used within the State of Idaho:

Sales in Idaho	Approximately	231,796,000 kwh.*
Transmission, distribution and sub-station losses pertaining to business in Idaho	"	4,100,000 kwh.
Station use in Idaho for plaintiff's own purposes and not for barter, sale or exchange	"	6,750,000 kwh.

* Kilowatt hours.

The remainder of said electricity as the same was generated or produced and transmitted by plaintiff, measured in terms of 201,955,000 kilowatt hours, was generated directly in interstate commerce between the States of Idaho, Utah and Wyoming by means of said interconnected system. The larger part of the station use in Idaho, was in conjunction with, and incidental to, such generation of electricity in Interstate Commerce.

The electrical energy so generated and transmitted in interstate commerce, subject to transmission and distribution losses of approximately 20 per cent., was sold by plaintiff in the States of Utah and Wyoming under contracts theretofore entered into between said Company and its customers in said States, and was necessary for the performance of said contracts.

Said Soda, Grace, Cove and Oneida stations, located in Idaho, have a combined capacity of 95,500 kilowatts and are connected directly to three 130,000 volt transmission lines extending directly from said stations through Idaho to a station named "Wheelon" in Utah, and thence to a receiving and switching station named "Terminal" near Salt Lake City, Utah. There is no use of electricity from said 130,000 volt lines in Idaho, the first use therefrom being at Wheelon, Utah, and the principal use of said electricity being at points in Utah and Wyoming after the same has passed through said Terminal station.

The local customer uses in Idaho from said Idaho stations are from separate outgoing lines segregated at the generating bus, and are relatively unimportant. Not to exceed two per cent of the energy at said station goes to serve said local customers. Said stations in Idaho were constructed directly, and, in fact, solely for Utah service (since extended to Wyoming), and the local customer uses in Idaho have been connected to said stations to gain the economy and service convenience that, except for these major stations, would be impracticable. In addition to electricity transmitted over said 130,000 volt lines, some electricity from said stations also reaches Utah over 44,000 volt lines from the Grace station.

The operations above described for the year 1930 are similar to and descriptive of plaintiff's operations as the same are now practiced during 1931, and plaintiff's opera-

tions in the future will be substantially the same, and in [fol. 7] substantially the same proportions as between intrastate and interstate commerce.

9. Upon the above described property, and in connection with its business aforesaid, plaintiff has been and will continue to be required to pay annually, taxes imposed under the general tax laws of Idaho, as follows:

(a) A general property tax levied annually upon all property, real and personal, of the plaintiff, situated within the State of Idaho, in proportion to its value, in common with all other property in the State not exempt from taxation. Plaintiff has paid such general property tax upon its property in Idaho annually; this tax for the year 1930 amounted to $412,090.07 and was based upon an assessed valuation of $11,088,009; and a like assessment will be made and a like tax levied and paid for the calander year 1931, and subsequent years.

(b) An annual license tax for the right to do business in the State of Idaho based upon plaintiff's authorized capital stock. Plaintiff has paid this tax annually, since its incorporation and qualification to do business in Idaho.

(c) An income tax, effective July 1, 1931, levied and collected upon the net income of plaintiff in Idaho.

None of the foregoing tax laws under which the taxes enumerated in this paragraph are levied and assessed against the plaintiff, have been repealed and all remain in full force and effect.

10. In addition to the taxes aforesaid levied against and collected from the plaintiff, another tax is sought to be imposed and levied against plaintiff by virtue of said Tax Act. Plaintiff in the year 1930, generated or produced within that part of its interconnected system located in Idaho, electricity measured in terms of 236,601,000 kilowatt hours, and for the year 1931 and thereafter will generate or produce approximately a like amount of electricity in the said State and upon said system. Under said Tax Act and in accordance with the interpretation placed thereon by the Commissioner, plaintiff would have paid for the year 1930, had said Tax Act been then effective, the sum of $18,300, and if said Tax Act is valid and plaintiff produces within the State of Idaho for

the year 1931 and thereafter a like amount of electricity to that so produced by it in the year 1930, it will pay in addition to the taxes mentioned in the preceding paragraph, the sum of approximately $69,000 for the last seven months of 1931, and approximately $120,000 per year thereafter. The gross business of the plaintiff in Idaho for the year 1930, from the production and sale of electricity within said State amounted to approximately $735,000, and will continue in approximately that amount annually thereafter.

11. The Tax Act violates Article I, Section 8, Clause 3 of the Constitution of the United States in the following respects.

With respect to electricity generated by plaintiff in Idaho on its interconnected interstate system operated in inter- [fol. 8] state commerce, as hereinbefore described: (a) If the tax attempted to be imposed by said Tax Act is laid on kilowatt hours generated as property, it is a tax on property after the same has become a part of interstate commerce, and is void as laying a burden on such interstate commerce; (b) If the tax attempted to be imposed by said Tax Act is not a property tax, but one upon the business of generating, manufacturing, or producing electricity or electrical energy, it constitutes as to the above described business in interstate commerce a direct interference with and burden upon the business of conducting interstate commerce, and upon the commerce so conducted.

The Tax Act contains no provision or means for measuring or computing separately the amount of the tax as applied to intrastate as distinguished from interstate commerce, and is therefore void in its entirety. Nor can the plaintiff withdraw from or discontinue its intrastate business.

12. The terms "generation", "manufacture" and "production" as applied to energy in the electrical form are merely synonymous designations applied to one aspect of the process of transferring energy from some source in nature (such as falling water) to some point where it may be usefully applied. The various electrical facilities used in said process are purely transferring devices, and the entire combined process—electric, magnetic and mechanical—is integral, continuous and essentially simultaneous,

as electricity travels with the speed of light—186,000 miles per second.

There is a continuous electrical and electro-magnetic path between the windings in the generator and the windings in the consumer's motor (or between the generator windings and the filament in an electric lamp or the electrodes in an electro-chemical cell). The entire electric system is a device for transferring the force (as of falling water) to, and applying it at, the point where it is to be utilized. Except as, and to the extent that, energy is called for and used at the final point of utilization, the electric generator neither receives from the water wheel shaft nor delivers to the electric transmission lines any energy other than that necessary to hold the equipment under constant rotation and electric charge in instant readiness to serve.

The power being transferred at any instant along the electric circuit existing between an electric generator at one place and a receiving device at another place is calculable at any point in the circuit from the electrical pressure or voltage between wires and the magnitude and characteristics of the electric current circulating in the wires, and is commonly expressed in kilowatts.

The "kilowatt-hour", the usual unit for measuring energy in the electrical form, is a mathematical product of the power relation in the electric circuit between a generator and a receiving device, measured in kilowatts, and the duration of time over which that relation is utilized, measured in hours.

In the case of plaintiff's system "electricity and electrical energy" is "generated, manufactured or produced" in its interstate Idaho-Utah-Wyoming system only if, as and when the combined demand of its customers, in Utah and [fol. 9] Wyoming, causes the turbine gates in the Idaho generating stations to open, thus permitting the energy of the falling water exerted within the turbine to be instantly transferred through the electric generator and other parts of the interstate electric system to the customers' motors, lights or other equipment. The entire process is a continuous inseparable transfer of energy from the water, through the generators, along the transmission lines, to the customers' points of use (in Utah and Wyoming) at a rate of speed of approximately 186,000 miles per second.

Each customer's demand (or use) occurs just as and when the customer desires, and is effected by his act of switching on lights, motors, ranges and other electrical appliances. As the demand is made, the electricity demanded is instantly, and as an immediate and direct result of said demand, generated at plaintiff's said stations specifically and solely for, and in response to, that demand and use. The demands of plaintiff's various customers in Utah and Wyoming occur on various secondary transmission and distribution lines in said States, which demands are brought partially together through local facilities and completely consolidated at Terminal station near Salt Lake City, Utah. There is thus created a continuing combined demand on the Idaho generating stations which exists throughout the Idaho-Utah-Wyoming system. The incidence of this combined demand as between the several stations on the system, whether in Idaho or in Utah, is, within the limits of the effective capacity of the several stations, under the control of plaintiff's Dispatcher at Terminal station, under whose directions the different stations may be placed in readiness for service.

Power or electricity generated at various Utah stations is likewise transmitted to Terminal station, and there commingled on common buses with power or electricity generated at the Idaho stations. Between Terminal and the customers' points of use, electricity or power can no longer be identified by its source, as in Idaho or Utah. The actual combined demand effective at Terminal station upon the 130,000 volt transmission line, automatically manifests itself on the various generators previously placed in readiness for service, in the manner hereinabove described, without point of rest between generation and Terminal station. Similarly, power or electricity transmitted from the Idaho stations to Utah over the 44,000 volt transmission lines extending from the Grace station, as described in Paragraph 8 hereof, enters in Utah a similar system interconnected with generating stations in Utah, and is distributed through substations, at which there is a similar loss of identity in Utah as between power generated in Idaho and in Utah.

The "recording watt-hour meter or meters, or other suitable instrument for measuring the electricity or electric energy produced", which is required by said Tax Act to be

maintained "at the point or points of production" on the plaintiff's interconnected Idaho-Utah-Wyoming system, will record, and must record, expressed in terms of kilowatt hours, the mathematical product of the power relation in the electric circuit between the generators of said system in Idaho and the receiving devices in Utah and Wyoming [fol. 10] (as their demands are combined at Terminal station), measured in kilowatts, and the duration of time over which that relation is utilized, measured in hours, including, in the measurement, the energy expended in the system, to meet losses and other necessary uses incident to the delivery of energy to such receiving devices. The measurement, therefore, upon which the tax sought to be imposed by said Tax Act is based, is, and will be, a direct measure of the magnitude and duration of interstate commerce in electricity or electric energy over said system, after said commerce has commenced and during the course thereof.

The generation of electricity is not the production of a commodity or material thing; it is a part of the process of rendering a service, and no electricity can be commercially generated or produced except as an inseparable part of the service rendered. Likewise the "Kilowatt hour" is the measure of such service and not a measure or unit of material things.

13. Said Tax Act violates the 14th Amendment of the Constitution of the United States in that it denies to this plaintiff engaged in the business of generating or producing electricity and electrical energy in the State of Idaho, the equal protection of the laws and renders it and its property liable to be taken without due process of law, all in violation of the 14th Amendment of the Constitution of the United States in that the penalties fixed for the failure to comply with any of the provisions of the Tax Act, including the making of such reports as are required by the Tax Act, and the payment of the tax imposed and levied thereunder, and for failure to open for inspection the books and records of the company, as is provided by Section 8 of the Tax Act, are so excessive as to intimidate, coerce and compel any persons coming under the Tax Act, including this plaintiff, to comply with the provisions of said Tax Act without the freedom of resorting to the courts to test the validity of the provisions of said Tax Act.

14. Said Tax Act further violates the 14th Amendment of the Constitution of the United States in that it denies to this plaintiff, so engaged in the business of generating or producing electricity and electrical energy within the State of Idaho, the equal protection of the laws and renders its property liable to be taken without due process of law in that Section 5 of the Tax Act compels appropriation and payment of money of the plaintiff for the sole and exclusive benefit of private individuals without compensation therefor.

15. Said Tax Act violates the Constitution of the State of Idaho in the following particulars:

(a) It is in conflict with Article III, Section 16 of said Constitution, which provides that every act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title, in that:

1. Both title and the act contain two subjects, i. e. (a) the levying of a license tax for revenue purposes; and (b) the application of credits on the electric bills of certain consumers of electricity.

[fol. 11] 2. The subject of the act is not expressed in the title in that the title purports to levy "a license tax of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange", whereas the act purports to levy upon the producer of electrical energy for barter, sale or exchange a tax of one-half mill on all kilowatt hours generated, manufactured or produced by him. Plaintiff as hereinbefore recited, has generated and will generate electrical energy substantially in excess of that generated for barter, sale or exchange, and the tax sought to be levied in the act is substantially different and greater than that expressed in the title.

3. The subject of the act is not expressed in the title in that the title provides that there shall be exempted from the tax "the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho", whereas the act provides "that the full amount of such license tax which would have been due from such producer of electricity" shall be so exempt. These

quantities are entirely different in that the energy "actually used" is substantially less than the energy taxable at the "place of production."

(b) The act in exempting from the tax the electricity and electrical energy "used for pumping water for irrigation purposes to be used on lands in the State of Idaho" and providing that a sum equal to the tax that would otherwise be paid by the producer, shall be paid to the consumer—

(1) violates Section 13 of Article I of said Constitution which provides that no person shall be deprived of property without due process of law,

(2) constitutes the levying of a tax for other than a public purpose, and in effect constitutes the levying of a tax for the benefit of an individual, in violation of Article VIII, Section 2, and Article VII, Section 2, of said Constitution,

(3) imposes a tax for the benefit of municipal corporations, to wit: irrigation districts which pump water by means of electricity supplied by plaintiff for irrigation purposes, in violation of Article VII, Section 6 of said Constitution, which provides the Legislature shall not impose taxes for the purposes of any county, city, town or other municipal corporation.

(c) If said tax is a license tax it constitutes a second license tax imposed in the same year for the same purpose in violation of Article VII, Section 2 of said Constitution which provides that "the Legislature may also impose a license tax (both upon natural persons and upon corporations, other than municipal, doing business in this State); also a per capita tax", in that plaintiff is subjected to and has paid the license tax described in Subdivision (b) of Paragraph 9 of this Bill, and also in that the tax sought to be imposed extends to business without the State.

[fol. 12] (d) If the tax imposed, or attempted to be imposed, by said act is a property tax levied on the kilowatt hour as property, the act, as applied to plaintiff, violates Section 2, Article VII of the Constitution in that it does not provide for the levying of a tax according to valuation, and Section 5 of Article VII in that it does not provide for the levying of a tax uniform upon the same class of sub-

jects within the territorial limits of the authority levying the tax, nor for the levying of such tax as will secure a just valuation of property for taxation purposes, and provides no method for determining or equalizing the value for taxation of the property taxed, and constitutes duplicate or double taxation of the same property.

(e) That said Extraordinary Session of the Legislature was called in violation of the provisions of Section 9 of Article IV of said Constitution in that at the time said call was made by the Governor there existed no "extraordinary occasion" justifying the calling of such Extraordinary Session. Said call was made prior to the adjournment of the regular session of the Legislature, for the purpose of considering matters that had theretofore been considered at said regular session, and no extraordinary occasion or condition arose or could have arisen between the adjournment of the regular and the convening of such Extraordinary Session; further, said Tax Act for raising revenue could not lawfully be considered or acted upon at an Extraordinary Session. The regular session of the Legislature, which adjourned immediately prior to the convening of the Extraordinary Session, had made all appropriations for the ensuing biennium until the convening of the next regular session, and had levied a general ad valorem tax sufficient to meet all expenses of the Government of the State for said biennium.

16. Said Tax Act contains so many uncertainties and ambiguities that the provisions thereof cannot be certainly, definitely or equitably enforced, and the taxes proposed to be levied thereunder, cannot be certainly, definitely or equitably levied on said kilowatt hours, or against said plaintiff so engaged in the manufacture, generation or production of electricity and electrical energy for barter, sale or exchange. Particularly is said Tax Act uncertain and ambiguous in the following respects:

(a) It cannot be determined from said act whether a tax is to be levied on all kilowatt hours generated or produced within the State of Idaho, including those used in the taxpayer's own operations or on such kilowatt hours as are generated or produced in the State of Idaho for barter, sale or exchange.

(b) Section 2 of said act provides that "taxes not paid on the due date shall become delinquent and shall bear interest from said due date at the rate of ten per cent per annum", while Section 8 of said act provides that any producer "who shall fail to pay the license tax herein provided for, or any part thereof, when due, shall be liable for three times the amount of the unpaid or delinquent tax. * * *"

[fol. 13] (c) Section 5 of said act provides that the "full amount of such license tax which would have been due from such producers of electricity or electrical energy, if such exemptions (irrigation pumping) had not been made, shall be credited annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity and electrical energy furnishing such power."

To determine the "full amount of such license tax which would have been due from the producer", the computation of the amount of the exemption must be based on the measurement made at the place of production. Billings to the irrigation user are based on measurements made at the place of use. These two points of measurement, i. e., at place of production and place of use, are sometimes separated by many miles, and intervening transmission and distribution losses may amount to so much as 20 per cent., hence the amount upon which the tax would have been due is different from and greater than the amount which forms the basis of producer's billing to the user. No provision is made by the act for computing the exemption upon the amount of electricity measured at the point of use and no provision is made for determining the relation between such points of use and production.

Any enforcement of said Tax Act by the defendants will depend on an arbitrary construction thereof, and will constitute a deprivation of property without due process of law in violation of Section 14, Article I of the Constitution of Idaho, as well as of the 14th Amendment to the Constitution of the United States.

17. Defendants, Commissioner and Attorney General, propose and have threatened to enforce, and, will endeavor to enforce, through appropriate action and the imposition of fines and penalties prescribed by the Tax Act, the col-

lection of the taxes thereby attempted to be imposed upon the plaintiff, notwithstanding the manifest invalidity of such Tax Act, as hereinbefore alleged. If the defendants so do, the plaintiff will suffer irreparable injury and will be subjected to a multiplicity of suits, will be threatened with heavy and severe penalties and has no plain, adequate and complete remedy at law but is remediless except through the equitable interposition of this court in that (a) suit for collection of taxes and penalties would be brought for each and every month that plaintiff failed to pay said tax; (b) the penalties are so unreasonable, burdensome and excessive that plaintiff could not safely refuse to pay the tax as the same is demanded; (c) there is no provision of the Statutes of Idaho under which the plaintiff could pay the tax under protest and recover back the amount so paid, but any payment so made would be credited into the general fund of the State and its reimbursement could be effected only through subsequent act of the Legislature. Therefore, plaintiff invokes the injunctive processes of this court to enjoin enforcement of the Tax Act against it, its agents, servants and employees, as hereinafter prayed, in order to prevent irreparable injury and avoid multiplicity of suits and imposition of unlawful penalties, which it might otherwise suffer.

[fol. 14] Wherefore this plaintiff prays—

That a writ of preliminary injunction issue from this court under the seal thereof directed to the said defendants and each of them, restraining and enjoining the said defendants and each of them, and/or their successors in office, and all persons acting in aid of said defendants or either of them or their successors in office, from in any way carrying out or enforcing the provisions of the said Tax Act hereinbefore described, either by way of requiring the plaintiff to make out the returns specified in said Tax Act, assessing, imposing or seeking to collect said tax by suit, either with or without the penalties specified in said Tax Act, or by enjoining the plaintiff from generating electricity and carrying on its business, or otherwise seeking to enforce the same, pending the final determination of this suit, and that upon final hearing said injunction be made permanent and said Tax Act declared null and void, and for

such other or further relief as may appear just and equitable.

To which end the plaintiff prays that Your Honors grant to plaintiff a writ of subpœna and respondendum, issuing out of and under the seal of this Honorable Court to be directed to each of the said defendants, commanding them and each of them on a certain day, and under appropriate penalties to be therein named, to appear before this Honorable Court, and then and there make full, true, direct and perfect answer (but not under oath or affirmation, the benefit whereof is hereby expressly waived by the plaintiff) to all and singular the premises and the allegations of this Bill of Complaint, and further to stand, do, perform and abide by such further order and decree as to Your Honors may seem just and meet.

And plaintiff will ever pray, etc.

Utah Power & Light Company, by Geo. B. Thomas, Vice-President, Salt Lake City, Utah. Attest: R. H. Jones, Asst. Secretary. (Seal.) Howley & Worthwine, Residence and Post Office Address Boise, Idaho; Merrill & Merrill, Residence and Post Office Address Pocatello, Idaho, Solicitors for plaintiff. Geo. R. Corey, Salt Lake City, Utah; John F. MacLane, New York, N. Y., Counsel.

[fol. 15] *Duly sworn to by George B. Thomas. Jurat omitted in printing.*

[fol. 16] EXHIBIT "A" TO BILL OF COMPLAINT

Chapter 3 (H. B. No. 3)

An act levying a license tax of one half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange; and providing for the collection and distribution of such tax; and for forms and procedure to be used and followed; requiring reports of the production of electricity and electrical energy and the furnishing of equipment for measuring same; prescribing penalties for violation of this Act; exempting from such license tax the electricity and electrical energy actually used for

pumping water for irrigation purposes on lands in the State of Idaho and providing that such exemptions shall accrue to the benefit of the consumer of such electricity and electrical energy; prescribing the duties of the State Commissioner of Law Enforcement under this Act, requiring him to give a bond for the faithful performance of said duties and fixing the amount thereof, and making an appropriation with which to carry out its purposes.

Be it enacted by the Legislature of the State of Idaho:

Section 1. That in addition to the licenses and taxes now provided by law, each and every individual, firm, partnership, common law trust, corporation, association or other organization, now engaged or hereafter to engage in the generation, manufacture or production of electricity and electrical energy in the State of Idaho, either through water power or by any other means for barter, sale, or exchange, and hereinafter referred to as the "producer", shall on or before the fifteenth day of each calendar month, beginning with the 15th day of July, 1931, render a statement to the Commissioner of Law Enforcement of the State of Idaho of all electricity and electrical energy generated, manufactured or produced by him or it in the State of Idaho, during the preceding calendar month and therewith pay a license tax of one-half (½) mill per kilowatt hour on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production and as shown on such statement in the manner and within the time hereinafter provided.

Section 2. Said license tax shall be remitted with the statement and paid on or before the fifteenth day of each month, beginning with July 15, 1931, to the Commissioner [fol. 17] of Law Enforcement, who shall receipt therefor and promptly turn same over to the State Treasurer, as other receipts of his office, and the State Treasurer shall place same to the credit of the General Fund. Taxes not paid on the due date shall become delinquent and shall bear interest from said due date at the rate of ten per cent per annum.

Section 3. On or before July 15, 1931, every producer referred to in Section 1 of this Act engaged in the pro-

duction, generation or manufacture of electricity or electrical energy, shall make and file with the Commissioner of Law Enforcement of the State of Idaho, on forms prescribed, prepared and furnished by the Commissioner of Law Enforcement, a duly acknowledged and verified certificate which shall contain: (a) the name under which the producer is transacting business in the State of Idaho; (b) his or its post office address and principal place of business within the state; (c) the address and location of his or its production plants or stations in Idaho; (d) the name and address of the managing agent; (e) the names and addresses of the several persons composing any firm or partnership constituting the producer, and, if a corporation, the corporate name under which it is authorized to transact business and the names and addresses of its officers, directors, resident general agent and attorney in fact; (f) certified copies of any papers necessary to show that such producer has complied with the laws of the State of Idaho in order to transact business in Idaho.

Section 4. Every such producer shall on or before the fifteenth day of each calendar month, beginning with July 15, 1931, and monthly thereafter, render to the Commissioner of Law Enforcement of the State of Idaho on forms prescribed, prepared and furnished by the Commissioner of Law Enforcement, a statement sworn to by the manager, president, secretary or treasurer of such producer, showing the number of kilowatt hours of electricity and electrical energy produced, generated or manufactured by him or it during the preceding calendar month. For the purpose of measuring such electricity and electrical energy such producer shall keep and maintain at the point or points of production, a recording watt hour meter or meters, or other suitable instrument for measuring the electricity or electrical energy produced, of a type to be approved by the Commissioner of Law Enforcement, the recordings therefrom to be kept on file at the principal place of business of such producer within the State of Idaho and same together with the books and records of such producer shall be subject to the inspection of the Commissioner of Law Enforcement, his deputies or assistants, during reasonable business hours.

Section 5. All electricity and electrical energy used for pumping water for irrigation purposes to be used on lands

in the State of Idaho is exempt from the provisions of this act, except in cases where the water so pumped is sold or rented to such irrigated lands. Provided, the exemption here given shall accrue to the benefit of the consumer of such electricity or electrical energy. Provided further that [fol. 18] the full amount of such license tax which would have been due from such producers of electricity and electrical energy, if such exemptions had not been made, shall be credited annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity and electrical energy, furnishing such power, and such producer shall include a statement of the amount of electricity and electrical energy exempted by this section, furnished by it for the purpose of pumping water for irrigation purposes on lands in the State of Idaho, to the Commissioner of Law Enforcement of the State of Idaho as a part of the statement required by Section 1 of this Act, together with a statement of the credits made on the power bills to the consumers of such electricity and electrical energy for the pumping of water for irrigation to be used on lands in the State of Idaho.

Section 6. Any producer of electricity or electrical energy referred to in Section 1 of this Act who shall hereafter engage in the generation, production or manufacture of electricity or electrical energy shall immediately upon purchasing or acquiring the plant, or installing equipment therefore, comply with the requirements of Section 3 of this Act.

Section 7. Any person, officer, partner, agent or representative of any producer referred to in Section 1 of this Act, who shall make any false statement or affiadvit in any certificate report or statement herein required to be made to the Commissioner of Law Enforcement hereunder shall be deemed guilty of perjury and upon conviction shall be punished by imprisonment in the state penitentiary not less than one nor more than fourteen years.

Section 8. Any producer referred to in Section 1 of this Act who shall violate any of the provisions of this Act or who shall fail to pay the license tax herein provided for, or any part thereof, when due shall be liable for three times the amount of the unpaid or delinquent tax, in a civil action

instituted for that purpose in any court of competent jurisdiction, by the Commissioner of Law Enforcement in the name of the State of Idaho, and in such suit upon application of the State, an injunction may be issued, without requiring any bond, restraining the defendant from continuing to produce electricity or electrical energy so long as any taxes due hereunder from said defendant remain delinquent.

Section 9. The State Treasurer shall, on or before the twentieth day of August of each year, beginning with August 20, 1931, prepare and furnish to the chairman of the State Board of Equalization a statement showing the total amount paid into the General Fund for the year ending August 15th of such year from the license tax provided by this Act, and the State Board of Equalization shall deduct such total amount so paid in determining the ad valorem tax for state purposes on real and personal property.

Section 10. In addition to any bond provided by law to be given by the Commissioner of Law Enforcement for the faithful performance of his duties, he shall give a fidelity [fols. 19-26a] bond in the penal sum of $50,000.00 to the State of Idaho, in the form and manner provided by law for similar bonds of state officers, and duly conditioned for the faithful performance of his official duties prescribed by this act.

Section 11. If any section or provision of this Act be adjudged unconstitutional or invalid for any reason, such adjudication shall not affect the validity of this Act as a whole or of any section or provision thereof which is not specifically so adjudged unconstitutional or invalid.

Section 12. There is hereby appropriated out of any moneys in the General Fund, not otherwise appropriated, the sum of Fifteen Thousand Dollars ($15,000.00) or so much thereof as may be necessary, with which to carry out the purposes of this act.

Approved March 17, 1931.

[fol. 27] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

MOTION TO DISMISS—Filed July 2, 1931

Come now the defendants, Emmitt Pfost, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, and move the court to dismiss the bill of complaint herein upon the following grounds:

I

It does not appear from the averments of said bill of complaint that the statute challenged as unconstitutional is in contravention of any designated provision of the State or Federal Constitution.

II

Said Bill of complaint does not set forth facts sufficient to constitute a valid cause of action in equity against these defendants, Emmitt Pfost, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho; or either of them.

[fol. 28]

III

That as to each of the following separate paragraphs, defendants move separately and severally to dismiss so much of said bill of complaint as therein set forth, to-wit:

(1) So much of said bill of complaint as is contained in paragraph 11 thereof which seeks injunctive relief on the ground that said act contravenes Article I, Section 8, Clause 3 of the Constitution of the United States.

(2) So much of said bill of complaint as is contained in paragraph 13 thereof which seeks injunctive relief on the ground that said tax act violates the 14th Amendment of the Constitution of the United States in that it denies to plaintiff the equal protection of the laws and renders its property liable to be taken without due process of law.

(3) So much of said bill of complaint as is contained in part 1 of sub-paragraph (a) of paragraph 15 thereof which

seeks injunctive relief on the ground that said tax act is in contravention of Article III, Section 16 of the Constitution of the State of Idaho, in that said act and the title thereto contain two subjects.

(4) So much of said bill of complaint as is contained in part 2 of sub-paragraph (a) of paragraph 15 thereof which seeks injunctive relief on the ground that the subject of the act is not expressed in the title with relation to the energy to be taxed.

(5) So much of said bill of complaint as is contained in part 3 of sub-paragraph (a) of paragraph 15 thereof which seeks injunctive relief on the ground that the subject of the act is not expressed in the title with relation to the amount of energy to be exempted from the tax.

[fol. 29] (6) So much of said bill of complaint as is contained in sub-paragraph (b) of paragraph 15 thereof which seeks injunctive relief on the ground that the exemption of said energy is in violation of Section 13 of Article I, Section 2 of Article VIII, Section 2 of Article VII, and Section 2, of Article VII of the Constitution of the State of Idaho.

(7) So much of said bill of complaint as is contained in sub-paragraph (c) of paragraph 15 thereof which seeks injunctive relief on the ground that said tax is in violation of Section 2, Article VII of the Constitution of the State of Idaho, in that it imposes double taxation.

(8) So much of said bill of complaint as is contained in sub-paragraph (d) of paragraph 15 thereof which seeks injunctive relief on the ground that said tax is in violation of Section 2, Article VII of the Constitution of the State of Idaho.

(9) So much of said bill of complaint as is contained in sub-paragraph (d) of paragraph 15 thereof which seeks injunctive relief on the ground that said tax is in violation of Section 5, Article VII of the Constitution of the State of Idaho.

(10) So much of said bill of complaint as is contained in sub-paragraph (e) of paragraph 15 thereof which seeks injunctive relief on the ground that said tax act was not passed at any lawful session of the Legislature of the State of Idaho.

(11) So much of said bill of complaint as is contained in sub-paragraph (a) of paragraph 16 thereof which seeks injunctive relief on the ground that said tax cannot be certainly, definitely or equitabley imposed with relation to the amount of energy upon which a tax is levied.

[fol. 30] (12) So much of said bill of complaint as is contained in sub-paragraph (b) of paragraph 16 thereof which seeks injunctive relief on the ground that said tax cannot be certainly, definitely or equitable imposed with relation to the penalties for which plaintiff may or will become liable.

(13) So much of said bill of complaint as is contained in sub-paragraph (c) of paragraph 16 thereof which seeks injunctive relief on the ground that said tax cannot be certainly, definitely or equitable imposed with relation to the amount of energy exempt from the tax.

For the reasons and upon the grounds:

(a) That each of such parts of said bill of complaint fails to set forth facts sufficient to constitute or tending to sustain any valid cause of action in equity against these defendants, or either of them.

(b) It does not appear from the averments of any of such parts of said bill of complaint considered separately that the statute challenged as unconstitutional is in contravention of any designated provision of the State or Federal Constitution.

Wherefore defendants pray that the whole of said bill of complaint may be dismissed, and as to each and every of said paragraphs and parts of paragraphs above designated, that so much of said bill of complaint as therein contained be dismissed, and that the said defendants may be hence dismissed with their costs in their behalf incurred. [fols. 31 & 32] Defendants further pray that the time to answer or file any further proper pleading be extended pending the determination of the present motion, and for such other and further relief as to the court may seem just.

Dated this 1st day of July, 1931.

Fred J. Babcock, Attorney General of the State of Idaho; Sidman I. Barber, Assistant Attorney General; Maurice H. Greene, Assistant Attorney General, Solicitors for Defendant.

Service of the foregoing and receipt of copy acknowledged this 2nd day of July, 1931.

Hawley & Worthwine, Merrill & Merrill, John F. MacLane, Geo. Corey.

[fol. 33] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT, DISTRICT OF IDAHO, SOUTHERN DIVISION

No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff,

vs.

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, Defendants

Hawley & Worthwine, of Boise, Idaho; Merrill & Merrill, of Pocatello, Idaho (Geo. R. Corey, of Salt Lake City, Utah; and John H. MacLane, of New York City, New York, of Counsel), for plaintiff, Utah Power & Light Company.

Fred J. Babcock, Attorney General of Idaho, and Sidman I. Barber and Maurice H. Greene, Assistants Attorney General, for defendants.

Before Sawtelle, Circuit Judge, and Webster and Cavanah, District Judges, as a Statutory Three-judge Court.

MEMORANDUM OPINION—Filed August 20, 1931

CAVANAH, District Judge:

The legislature of Idaho at an extraordinary session enacted an Act requiring those engaged in the generation and production of electricity and electrical energy in the state for barter, sale or exchange, to pay a license tax of one-half mill per kilowatt hour on such electricity and directed that it be measured at the place of production by recording watt hour meters or other suitable instruments. [fol. 34] The plaintiff, Utah Power & Light Company, en-

gaged in generating, transmitting and distributing electrical power and energy as a public utility in the state of Idaho, Utah and Wyoming, brings this suit challenging the constitutionality of the Act on the grounds that it violates the equal protection, due process and commerce clauses of the constitution of the United States and conflicts with and violates certain provisions of the constitution of the State of Idaho, and applies for an interlocutory injunction restraining the enforcement of the Act pending the decree on final hearing.

Numerous reasons are asserted by the plaintiff as to why the Act should fall as controvening the provisions of the federal and state constitutions, and among which there is first presented the question as to whether or not the Act violates the Fourteenth Amendment of the Constitution of the United States and Section 13 of Article 1 of the Idaho Constitution which have similar inhibitions against taking property without due process of law, as it is urged that it denies the plaintiff equal protection of the law and renders its property liable to be taken without due process of law. The penalty prescribed in the Act and the exceptions provided in Section 5 thereof, plaintiff asserts, furnishes the basis for this claim. Generally it has been said that the courts have no interest in the policy of the state revenue laws so long as equal protection is not denied and property is not taken without due process of law and it is reasonable and not arbitrary. The Fourteenth Amendment, "only requires the same means and methods to be applied impartially to all the constituents of a class so that the law shall operate equally and uniformly upon all persons in similar circumstances." Kentucky Railroad Tax Cases 115 U. S. 321; Magoun v. Illinois Trust and Bank 170 U. S. 283; State v. Harn et al. 27 Ida. 782, 152 Pac. 275; and [fol. 35] this policy may be carried out in a revenue as well as a police measure. The constitutional provision was not intended to compel the state to adopt an iron rule of equal taxation for it may exempt certain classes of property from taxation at all, so long as the legislature proceeds within reasonable limits. The fact that the state in adjusting its revenue laws has exempted a certain class does not deny the equal protection of the law and this right to classify for taxation is granted to impose an occupation tax if equally

applicable to all within the class. Hope Natural Gas Company v. Hall et al. 274 U. S. 284; Heisler v. Thomas Collier Co. et al. 260 U. S. 245; Armour Packing Co. v. Lacey 200 U. S. 226; Citizens Telephone Co. v. Fuller 229 U. S. 322; Clark v. Titusville 184 U. S. 329; American Manufacturing Co. v. City of St. Louis 250 U. S. 459. But it is urged that as section 5 of the Act exempts all electrical energy used for pumping irrigation water for Idaho lands except where the water so pumped is sold or rented to such lands on condition that the exemption which accrues to the benefit of the consumer of such electricity and the full amount of such tax which would have been used from such production if the exemption had not been made, should be granted annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity, the statute is the taking of private property for private purposes in violation of the provisions of the state constitution and not due process of law. A similar statute of the state exempting property used for irrigation pumping purposes from a general property tax of an electrical company was held by the Supreme Court of Idaho as not controvening the state constitution for the reason that it did not levy a tax, but created an exemption, and that the credit of the state was not thereby extended as there was no obligation on the part of the state created by the state and the fact [fol. 36] that, "the transfer of the ultimate benefit of the exemption to the consumer does not change its character as an exemption statute or require us to hold that it grants a subsidy to private individuals in a manner forbidden by the constitution." Williams v. Baldridge 48 Ida. 618, 284 Pac. 603. Accepting then the decision of the State Supreme Court in interpreting its state constitution as controlling, the federal court will not interfere in the matter of exemption from state taxation under the Fourteenth Amendment as such matters of classification are of state policy to be determined by the state. Florida Central and Peninsular Railroad Co. v. Reynolds 183 U. S. 471; Bell's Gap Railroad Co. v. Pennsylvania 134 U. S. 232.

The suggestion is made that because the tax is not reflected in present rates the exemption reduces its charges to its consumers for electrical energy for pumping water for irrigation purposes and thereby results in a reduction

of its rates, and would be the taking of property without due process of law is without merit when we consider that under its powers of rate-making the Public Utilities Commission of the State takes into consideration all taxes paid and exemptions required to be allowed in fixing the rates to be charged, and this being the case there can be no confiscation of plaintiff's property as this tax exemption would in effect be borne by all the consumers, thereby relieving plaintiff from paying it at all.

As to the penalty provided in the Act, it is sufficient to say that it is not involved in the present suit as there is no attempt to now enforce it. It is separate from the other provisions of the Act and the Act contains a section that if any provision of it be held unconstitutional for any reason it shall not affect the validity of the Act as a whole, or of any provision which is not specifically adjudged invalid, [fol. 37] so therefore, in advance of an attempt to enforce the penalty we need not pass upon its validity. Ohio Tax Cases 232 U. S. 576; Grenada Lumber Co. v. State of Mississippi 217 U. S. 433; Western Union Telegraph Co. v. City of Richmond, 224 U. S. 160; Louisville & Nashville Railroad v. Garrett et al 231 U. S. 298.

Even if Sections 5 and 11 of the Act are unconstitutional the court is not warranted in declaring the whole Act void unless all the provisions are connected in subject matter and depend on each other, for it is settled that an exemption or the penalty clause in a statute may be invalid, yet the rest of the statute remains unaffected and could be carried out. Gillesby v. Board of Commissioners 17 Ida. 586, 107 Pac. 71; State v. Bird 29 Ida. 47, 156 Pac. 1140; Little Rock & Ft. Smith Ry. Co. v. Worthen 120 U. S. 97.

Thus viewing the Act we have no doubt that even if sections 5 and 11 are excluded there will remain a workable statute whose provisions will not depend upon the sections excluded and the Act would be capable of enforcement.

The fact that the Act failed of passage at the regular session of the legislature without having contained in it the exemption provision and was thereafter adopted with the exemption clause, would not justify the court in presuming that the legislature would not have passed it without the exemption provision for it does not appear that the Act would have been passed at the regular session with the

exemption provision, or that it ever came to a vote. It is evident that the primary purpose of the Act was to require all engaged in the generation and production of electricity and electrical energy in the state to pay a tax and that it operates alike upon all who are so engaged. The tax required to be paid is uniform throughout the state and equal upon the same class similarly situate which removes [fol. 38] from it the charge that it infringes upon the equality clause.

The charge that the Act imposes a double license for the same purpose in violation of Section 5 Article 7 of the State Constitution is not well founded when we come to consider the two statutes involved, for Section 4782 of the Idaho Compiled Statutes requires the payment of an annual license tax upon the right to do business as a corporation in the state and affects all corporations alike, while the tax imposed by the Act here affects all who generates electrical energy, whether incorporated or not, and is an excise tax upon the right to engage in that particular business. The rights are not the same as one relates to a tax upon the franchise of the corporation as a privilege for being a corporation in the state and the other for the privilege of conducting the business contemplated by the charter of the corporation. It is not requiring the payment of a double tax. Home Ins. Co. v. New York State 134 U. S. 594; Gundling v. Chicago 177 U. S. 183; Baldwin Tool Works v. Blue et al. 240 Fed. 202. Nor is the Act subject to the objection that if the tax is a property tax it also violates the constitution of the state in that it does not provide for the levying of a tax according to valuation and uniform upon the same class of property for the reason that the tax here is not one on property as contemplated by the constitution but nothing more than an occupation tax which is distinguishable from a property tax and is not therefore governed by the constitutional provisions. Alaska Fish Salting & By-Products Co. v. Smith 255 U. S. 44; Alaska Pacific Fisheries v. Alaska 236 Fed. 52; Spreckels Sugar Refining Co. v. McClain 192 U. S. 397; Ohio Tax Cases, supra; Northern Pacific Railway Co. v. Gifford, 25 Ida. 196, 136 Pac. 1131.

[fol. 39] Another question has arisen which we should notice. It is whether the extraordinary session of the

Legislature was called as required by Section 9 of Article 4 of the State Constitution, it being asserted that there did not exist an extraordinary occasion justifying its calling, and therefore, the session was not constitutionally convened and the passage of the Act at that session was void. This provision of the Constitution provides that, "The Governor may, on extraordinary occasions, convene the Legislature by proclamation, stating the purposes for which he has convened it; but when so convened it shall have no power to legislate on any subjects other than those specified in the proclamation; * * *". It vests in the Governor power and discretion to convene the Legislature on extraordinary occasion in session which the framers of the Constitution have intrusted to the chief executive officer of the state alone. It would be an unprecedented proceeding for the Court to entertain a controversy wherein proof is offered to ascertain judicially whether an extraordinary occasion existed of sufficient gravity to authorize the Governor to convene the legislature in extra session. The character of the legislation to be considered by the legislature was by the Constitution left to the Governor, and a review of such discretionary act of the Governor should not be done by the Courts. In re Legislative Adjournment 18 R. I. 830, Farrelly v. Cole 56 Pac. 497, in re State Census 21 Pac. 477, Lasseter v. State 64 So. 847, Simpson v. Hill 263 Pac. 643.

The further claim is that the Act is so uncertain that it is incapable of enforcement and that its interpretation and enforcement depends on the arbitrary construction placed thereon by the Commissioner of Law Enforcement, as it is [fol. 40] pointed out that the terms of the Act will require that all electricity produced by the company engaged in the generation for sale or exchange shall be subject to the tax at the place of production, without deduction for the use by the producer of electricity for its own purposes or the losses which occur in the transmission which makes it uncertain to ascertain by measurement at the point of production and that a conflict appears in Sections 2 and 8 thereof, as Section 2 provides that in case the tax is not paid when due it shall bear interest at ten per cent per annum, and section 8 calls for a penalty for three times the amount of the unpaid tax. An analysis of the title and the body of the

Act does not show any ambiguity as to the basis of the measurement of the tax, for the title says, "levying a license tax of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange," and Section 1 provides, that "every individual, firm, partnership, common law trust, corporation, association or other organization now engaged or hereafter to engage in the generation, manufacture or production of electricity and electrical energy in the State of Idaho, either through water power or by any other means for barter, sale, or exchange, and hereinafter referred to as the "producer", shall on or before the fifteenth day of each calendar month, beginning with the 15th day of July, 1931, render a statement to the Commissioner of Law Enforcement of the State of Idaho of all electricity and electrical energy generated, manufactured or produced by him or it in the State of Idaho, during the preceding calendar month and therewith pay a license tax of one-half (½) mill per kilowatt hour on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production * * *". Since Section 1 provides that those engaged in the genera-
[fol. 40½] tion of electricity "for barter, sale, or exchange * * *" pay a license tax of one-half (½) mill per kilowatt hour on all such electricity", it seems clear that it refers to energy generated for "barter, sale, or exchange", the same as referred to in the title. Nor does there appear to be a conflict in Sections 2 and 8, as Section 2 requires the payment of interest from the date the tax becomes due, that is, from the date of the delinquent tax which shall draw interest, while Section 8 provides that for a violation of any of the provisions of the Act or failure to pay the tax, the producer shall be liable, in addition to the interest, three times the amount of the unpaid tax. Section 8 only provides for an additional penalty to the payment of the interest, and that is a matter within the power of the legislature to impose. A statute should not be held void for uncertainty if any sensible or practical interpretation can be given. Alaska Pacific Fisheries v. Alaska (9th C. C. A.) 236 Fed. 70 affirmed, 242 U. S. 648, and the language in this Act "for barter, sale or exchange" of the electricity produced and "pay a license tax of one-half (½) mill per kilo-

watt hour on all such electricity and electrical energy so generated * * *", is definite in its relation to the energy by which the tax is to be measured.

We are next to inquire whether the Act runs counter to Section 16 Article 3 of the State Constitution as it is claimed that the Title and the Act contain two different subjects, namely, (a) the levying of a license tax for revenue purposes, and (b) the application of credits on the electric bills of certain consumers of electricity, and that the subject of the Act is not expressed in the Title, in that the Title purports to levy "a license of one-half mill per kilowatt [fol. 41] hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho, for barter, sale or exchange", whereas the Act purports to levy upon the producer of electric energy for barter, sale or exchange, a tax of one-half mill on all kilowatt hours generated, manufactured or produced by him", and further, in the Title there is exempted from the tax "the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho", whereas the Act provides "that the full amount of such license tax which would have been due from such producers of electricity shall be so exempted". The privision of the Constitution applicable declares: "Every act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title; but if any subject shall be embraced in an act which shall not be expressed in the title, such act shall be void only as to so much thereof as shall not be embraced in the title".

The material parts of the Title and the Act are, "An Act levying a license tax * * * on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange * * *". Section 1 of the Act provides "* * * each and every individual, firm, * * * engaged * * * in the generation, manufacture or production of electricity and electrical energy in the State of Idaho * * * for barter, sale or exchange, shall * * * pay a license tax of one-half (½) mill per kilowatt hour on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production," and further the Title provides: "Exempting from such license tax the electricity and elec-

trical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho and providing that such exemptions shall accrue to the benefit of the consumer of such electricity and electrical energy." And [fol. 42] Section 5 provides: "All electricity and electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho is exempt from the provisions of this Act, except in cases where the water so pumped is sold or rented to such irrigated lands. Provided, the exemption here given shall accrue to the benefit of the consumer of such electricity or electrical energy."

It will be observed that Section 1 of the Act requires the producer to pay the tax on electricity and electrical energy generated, and that the only producer who is required to pay the tax is one who generates for barter, sale or exchange, and not where the plaintiff would be generating for its own use, and the language thus quoted relating to the exemption in the Title and Act are identical. Both exempt only electrical energy used for a specified purpose.

It is apparent that anyone reading the Title would be advised of the proposed legislation. It is clear and definite and sufficiently broad to cover the different provisions of the Act, so we are unable to give to the Title and the Act the interpretation urged by plaintiff, for both covers energy generated for barter, sale or exchange, and provides for the exemption, as the Title is not limited to energy actually used, and the Act to what is produced, for as already said both the Title and Act cover energy generated for barter, sale or exchange and the payment of the tax thereon. We think it clear that the Act only embraces one subject and matters properly connected therewith, as it relates to the same subject and is not foreign to the subject expressed in the Title. The Title refers to the energy taxed and to the exemption, the same as stated in the Act. They both provide for a license tax of one-half mill per kilowatt hour on [fol. 43] electricity generated, manufactured or produced for barter, sale or exchange, as well as an exemption of electricity used for pumping water for irrigation purposes. The exemption is germane to the provision for the tax, and may properly appear in the Act.

We find that the Supreme Court of Idaho in its interpretation of Section 16 of Act 3 of the Idaho Constitution, has held that if one can "reasonably gather the purpose and

object of the Act as found in the bill from its Title, "and put a person * * * on notice of the contents of the Act" (Turner v. Coffin, 9 Idaho, 338, 74 P. 962), that would be a compliance with the Constitutional requirements.

In a recent decision of the Supreme Court of the State in the case of State v. Pasta, 44 Idaho 671, 258 Pac. 1075, the Court said: "The object of the Title of an act is to give a general statement of the subject matter contained therein, and the act must not be so construed as to extend its effect beyond the limits fixed in the title. The title, however, must of necessity be brief; and a general statement will be held to be sufficient to include all the provisions having a reasonable connection with the subject matter mentioned in the title and which have a reasonable tendency to accomplish the purpose of the act."

And again the Supreme Court of the State has said: " 'If the provisions of a statute all relate directly or indirectly, to the same subject, have a natural connection, and are not foreign to the subject expressed in the title, it is permissible to unite them in the same act. The objections should be grave, and the conflict between the constitution and statute palpable, before the judiciary should disregard a legislative enactment upon the sole ground that it embraces more [fol. 44] than one subject,' * * * 'Provisions of an act may be numerous; but, however numerous, if they can be, by fair intendment, considered as falling within the subject matter of legislation, or necessary as ends and means to the attainment of the subject, the act will not conflict with the constitution.' * * * '* * * it was not intended to obstruct honest legislation, or to prevent the incorporation into a single act of the entire statutory law upon one general subject.' " Pioneer Irr. Dist. v. Bradley, 8 Ida. 310, 68 Pac. 295.

The further charge made by the plaintiff that the Commissioner will construe the Act to impose a tax based on all electricity generated or produced within the State of Idaho, and not solely upon such electricity for barter, sale or exchange and other charges as to the manner in which he will attempt to enforce the Act, are not matters which will warrant the Court in holding the Act invalid, but are to be considered in a proper proceeding, questioning the manner

of administering the Act by the Commissioner when enforcing it.

Finally we are thus brought to the consideration of the difficult problem as to whether in the practical operation of plaintiff's electrical system, the generation of electricity, is a continuous, inseparable transfer of energy constituting an unbroken chain from the state of its origin to that of its destination and interstate from beginning to end which will determine the question as to whether the legislative act when applied to plaintiff's operations infringes on the commerce clause of the constitution. Applicable to this issue of facts is the fundamental principle that where the production, transportation and delivery of the product is essentially local and not essentially national in character and the local interest is paramount and its production largely classified as essentially local in its nature, the enforcement of an excise tax in such a transaction does not place a direct [fol. 45] burden upon interstate commerce, and in reaching a conclusion in cases of this kind the question as to whether it actually burdens interstate commerce must be determined from the various circumstances. The essential test is whether the tax in fact burdens interstate commerce, even though it is laid upon a privilege which the state has power to tax, is illustrated by those cases which hold that where one is doing both local and interstate business the state can nevertheless impose a license tax for doing local business in such amount or manner if it appears that the production of the product is essentially local and indispensable with the carrying on of the business, and that the local interest is paramount. Neither the character of the commodity nor the preparation of it, or the intention of the owner to transport it out of the state puts it in interstate commerce for the movement of the commodity for another state must have actually, in good faith begun and be going on, and the character of the transportation depends upon all the circumstances looking to what the owner had done in preparation for the journey and in carrying it out. There is no doubt of the power of the state to impose a license tax upon electrical utility business within the state and to measure it by the standard of production within the state and whether it would deprive one of constitutional rights depends upon its practical operation and effect.

The Act here requires that the tax be computed according to the amount of electricity and electrical energy by kilowatt hours generated in the state and measured at the place of production irrespective of whether it be delivered or sold within or without the state. The point of time [fol. 46] when an article ceases to be under power of the state and comes under the protection of the constitution was considered by the Supreme Court in the case of Coe v. Errol, 116 U. S. 517, where it is said: "There must be a point of time when they (goods) cease to be governed exclusively by the domestic law and begin to be governed and protected by the national law of commercial relation, and that moment seems to us to be a legitimate one for this purpose, in which they commence their final movement for transportation from the State of their origin to that of their destination." There is a distinction between production and commerce as commerce succeeds production and is not a part of it. Production or manufacture is a transformation of raw material into a change of form for use while the functions of commerce consist in the purchasing, selling and exchanging of commodities and the transportation incidental thereto. Hammer v. Dagerhart et al., 247 U. S. 251. When in dealing with this subject Mr. Justice Day of the Supreme Court in the case of Pennsylvania Gas Co. v. Public Service Commission, 252 U. S. 23, gives an interesting discussion of the permission granted to the state in dealing with subjects which have relation to interstate commerce, and asserts:

"In dealing with interstate commerce it is not in some instances regarded as an infringement upon the authority delegated to Congress, to permit the States to pass laws indirectly affecting such commerce, when needed to protect or regulate matters of local interest. Such laws are operative until Congress acts under its superior authority by regulating the subject-matter for itself. In varying forms this subject has frequently been before this court. The previous cases were fully reviewed and deductions made therefrom in the Minnesota Rate Cases, 230 U. S. 352. The paramount authority of Congress over the regulation of interstate commerce was again asserted in those cases. It was nevertheless recognized that there existed in the states a permissible exercise of authority, which they might use [fol. 47] until Congress had taken possession of the field

of regulation. After stating the limitations upon state authority, of this subject, we said (p. 402): 'But within these limitations there necessarily remains to the States, until Congress acts, a wide range for the permissible exercise of power appropriated to their territorial jurisdiction although interstate commerce may be affected. It extends to those matters of a local nature as to which it is impossible to derive from the constitutional grant an intention that they should go uncontrolled pending Federal intervention. Thus, there are certain subjects having the most obvious and direct relation to interstate commerce, which nevertheless, with the acquiescence of Congress, have been controlled by state legislation from the foundation of the Government because of the necessity that they should not remain unregulated and that their regulation should be adapted to varying local exigencies; hence, the absence of regulation by Congress in such matters has not imported that there should be no restriction but rather that the States should continue to supply the needed rules until Congress should decide to supersede them.''

''The rates of gas companies transmitting gas in interstate commerce are not only regulated by Congress, but the Interstate Commerce Act expressly withholds the subject from federal control. C. 309, Sec, 7, 36 Stat. 539, 544.

''The thing which the State Commission has undertaken to regulate, while part of an interstate transmission, is local in its nature, and pertains to the furnishing of natural gas to local consumers within the city of Jamestown in the State of New York. The pipes which reach the customers served are supplied with gas directly from the main of the company which brings it into the State, nevertheless the service rendered is essentially local, and the sale of gas by the company to local consumers who are reached by the use of the streets of the city in which the pipes are laid, and [fol. 48] though which the gas is conducted to factories and residences as it is required for use. The service is similar to that of a local plant furnishing gas to consumers in a city.''

When we come to analyze the bill and the affidavits filed on the application for an interlocutory injunction from which we must look to determine whether there is a real dispute over material questions of fact, we find that there

is alleged in the bill that the plaintiff owns and operates an interconnected electrical power system consisting of generating stations, transmission and distribution lines and other electrical equipment located in the states of Idaho, Utah and Wyoming, whereby electrical energy is generated, transmitted, distributed and delivered for sale and exchange to its customers in each of said states. That the principal use of the electricity generated by it are at points in the states of Utah and Wyoming and its stations in Idaho were constructed solely for Utah and Wyoming service and that its local customers in Idaho have been connected to said stations to gain the economy and convenience thereof; that there is a continuous electric and electro magnetic belt between the windings in the generator and the windings in the consumer's motor; that the entire electric system is a device for transmitting the force (as the falling water) to and applying it at the point where it is to be utilized and the entire process is a continuous, inseparable transfer of energy from the water through the generators along the lines to the consumer's point of use in Utah and Wyoming; that the measurement of energy "upon which the tax sought to be imposed by the Act is based, is, and will be, a direct measure of the magnitude and duration of interstate commerce in electricity or electrical energy over said system, after said commerce has [fol. 49] commenced and during the course thereof." The affidavits filed by the defendant take an opposite view to that contended for by the plaintiff as to how and at what point the production of electrical energy begins and is completed by plaintiff's system, or that the same is operated in interstate commerce, so it is obvious from the allegations of the bill and what is set forth in the affidavit there is presented to the court at this stage of the proceedings a real controversy over material questions of fact which cannot be satisfactorily determined upon the presentation of affidavits and yet must be determined by the court before the constitutional validity of the Act can be determined. Ohio Oil Co. v. Conway, 279 U. S. 813; Love et al. v. Atchison T. & S. F. Ry. Co., 185 Fed. 321.

In view of what has been said and of the absence of a law of the state of any remedy enforcible by the plaintiff if the tax be paid and afterwards held invalid by the final decree, the motions of the defendant to dismiss and strike

are denied and the application of the plaintiff for an interlocutory injunction is granted upon the plaintiff giving an adequate bond whereby in the event the Act in question is adjudged valid by the final decree, the plaintiff and its surety will pay such amounts to satisfy the tax fixed by the Act with the interest as provided in the Act.

[fols.50-53] In United States District Court

[Title omitted]

Order Granting Application for Interlocutory Injunction—Filed Aug. 25, 1931

In harmony with memorandum opinion of the court filed herein on August 20th, 1931:

It is hereby ordered that the motions of the defendants to dismiss and strike are denied and the application of the plaintiff for an interlocutory injunction is granted upon the plaintiff giving an adequate bond as provided for in the order granting the interlocutory injunction filed in this cause.

Charles C. Cavanah, District Judge.

[File endorsement omitted.]

[fol. 54] [File endorsement omitted]

In United States District Court

[Title omitted]

Stipulation as to Right of Defendants to File Amended Answer—Filed Sept. 1, 1931

It is hereby stipulated by and between the parties to the above entitled cause, through their solicitors or attorneys of record, whose names are subscribed hereto, that in consideration of the taking of the deposition of Robert A. Millikan, a witness on behalf of plaintiff, pursuant to the stipulation of counsel herein filed and approved by the

Court, and which will require the absence of counsel from the state during a portion of the time granted to defendants by the stipulation of counsel and order of the Court herein, in which to file an answer to plaintiff's Bill of Complaint, that the issues of this cause may be made up by the filing of an answer by defendants before the taking of such deposition and that defendants shall have the right as of course to amend said answer in any particular at any time within ten days from the taking of said deposition.

In witness whereof the parties hereto have caused this stipulation to be signed by their solicitors or attorneys of record in their behalf this 1st day of September, 1931.

Hawley & Worthwine, Residence Boise, Idaho; Mer-
[fol. 55] rill & Merrill, Pocatello; Geo. R. Corey, Residence Salt Lake City, Utah; John F. MacLane, Residence New York City, N. Y., Attorneys and Solicitors for Plaintiff. Fred J. Babcock, Attorney General of the State of Idaho; Sidman I. Barber, Asst. Atty. Gen. of the State of Idaho; Maurice H. Greene, Asst. Atty. Gen. of the State of Idaho, Attorneys and Solicitors for Defendants.

Upon the reading and filing of the foregoing stipulation, it is ordered that the same be and hereby is approved.

Dated this 1st day of September, 1931.

Charles C. Cavanah, District Judge.

[fol. 56] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

AMENDED ANSWER—Filed September 22, 1931

Come now the defendants, Emmitt Pfost, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, and for their amended answer to the Bill of Complaint of plaintiff herein filed with leave of court herein say:

1

Admit that plaintiff is a corporation, has complied with the laws of the State of Idaho, and is doing business in the states of Idaho, Utah and Wyoming, and that the business of plaintiff is that of generating and of transmitting and distributing electrical energy, as a public utility for barter, sale or exchange, as alleged in Paragraph I of said Bill of Complaint, except that defendants deny that plaintiff is or has been engaged in generating any electrical power or energy in interstate commerce between any states.

[fol. 57] 2

Defendants admit the allegations of Paragraph II of said Bill of Complaint.

3

Defendants admit that the matter in controversy herein, exclusive of interest and costs exceeds the sum of $3,000 and is between citizens of different states, but deny that the same arises under the Constitution of the United States.

4

Defendants admit the allegations of paragraph 4 of said Bill of Complaint.

5

Defendants admit that the defendant, Commissioner has prescribed, prepared and furnished forms of statements for tax returns under said tax act but denies that said Commissioner has in or by said forms construed or that he will otherwise construe said tax act to impose a tax on all electrical energy generated or produced within the State of Idaho, or upon any such energy other than that produced within said State for barter, sale or exchange, and deny that any electricity or electrical energy is generated or produced in interstate commerce.

6

Defendants deny that said Commissioner has notified plaintiff that it must pay a tax upon all electrical energy generated, manufactured or produced by it within the State

of Idaho, for any month, deny that said Commissioner intends to compute or ascertain or assess against plaintiff any taxes upon any electrical energy except that produced [fol. 58] and generated by plaintiff in the State of Idaho for barter, sale or exchange.

7

Defendants deny that said Commissioner will impose upon plaintiff any penalty upon a failure of plaintiff to pay a tax upon all electrical energy by it produced within the State of Idaho, or that defendants will sue to collect such taxes and penalties upon such failure of plaintiff, or otherwise except upon or in case of the failure of plaintiff to pay taxes due under the provisions of said act upon all electrical energy generated by plaintiff within the State of Idaho for barter, sale and exchange; deny that said tax act or the tax thereby levied and imposed or the penalties or injunctive process thereby provided for are unlawful or void or in violation of either the Constitution of the United States or the Constitution of the State of Idaho.

8

Defendants admit that plaintiff owns and operates an interconnected power system consisting of various generating stations locate- within the states of Idaho, Utah and Wyoming and transmission and distribution lines and other electrical equipment between said stations and points of use and of delivery to customers in said states, and that electrical energy generated at such stations is transmitted and delivered by means of such lines and other equipment to such customers, who include persons, firms, corporations and irrigation districts pumping water by electricity for irrigation purposes to be used on lands in the State of Idaho; but deny that any electrical energy is generated or [fol. 59] produced by any part of such system other than by such generating stations;

Admit that as a part of said system, plaintiff owns and operates certain hydro-electric stations in Idaho, among them said stations known as Soda, Grace, Cove and Oneida. These defendants are without information as to the amount of electrical energy by the generating stations of plaintiff in Idaho during 1930; and are not informed as to the

amount of such electrical energy sold by plaintiff in Idaho nor as to the amount used or consumed by it in transmission, distribution or sub-station losses pertaining to business in Idaho, nor as to the amount of such electrical energy consumed in station use by plaintiff in Idaho for plaintiff's own purposes and not for barter, sale or exchange; and being without such information denies each of such allegations of the Bill of Complaint and pray that plaintiff be required to make strict proof as to all such matters and facts. That defendants are without information as to the amount of electrical energy generated or produced by plaintiff at its stations in Idaho, during the year 1930, and transmitted by plaintiff to points without the State of Idaho, or as to the percentage of transmission or distribution losses sustained by plaintiff in transmission of electrical eneregy to points without the State of Idaho or as to the capacity of said Soda, Grace, Cove and Oneida stations or their connections with any lines or the points of use of electricity therefrom; or as to the local customer uses in Idaho from said stations, or the amount of energy generated in said [fol. 60] stations and delivered and sold to local customers, or as to the principal place of use of electricity transmitted by or over any lines; and being without such information deny each and every of such allegations of plaintiff's Bill of Complaint, and pray that plaintiff be required to make strict proof as to all of such matters and facts. Defendants deny that any electrical energy is generated by any of plaintiff's stations in Idaho in interstate commerce between any states and deny that plaintiff's said stations in Idaho were constructed solely or directly for the generation of electrical energy to be delivered to customers in Utah or Wyoming; and deny that the local customer uses from said stations in Idaho have been connected to said stations solely for the economy and service convenience permitted thereby but allege the truth and fact to be that the electrical energy generated by plaintiff at its said stations is transmitted, delivered and sold to such points and customers, in whatever localities, as may be reached by plaintiff an economic and practical commercial employment of its system (subject, of course, to regulation by the Public Utilities Commissions of the several states), and that such local customers in Idaho constitute a part of the market available to plaintiff.

9

Admit the allegations of Paragraph IX of plaintiff's Bill of Complaint, except that they deny that the annual license tax referred to in sub-paragraph (b) thereof, is imposed upon plaintiff for the right to do business in the State of Idaho and allege that the same is a corporate franchise tax [fol. 61] imposed upon plaintiff for the right to exist and do business as a corporate entity within the said state.

10

Defendants deny that under said tax act or in accordance with the interpretation placed thereon by the said Commissioner plaintiff would have been required for the year 1930 to pay a tax upon all electrical energy by it generated in the State of Idaho; that defendants are without information as to the total number of kilowatt hours of electrical energy generated and produced by plaintiff within the State of Idaho during the year of 1930 for barter, sale or exchange, nor as to the amount of such electrical energy which plaintiff will generate and produce during the year 1931 for barter, sale or exchange and therefore are without information as to the amount of taxes which would have been payable under said act during the year 1930, or which will become payable thereunder during the year 1931, and being without this information pray that plaintiff be required to make strict proof as to all such matters and facts.

11

Defendants deny that said tax act violates Article I, Section 8, Clause 3 of the Constitution of the United States in any respect, and particularly deny that any electricity or electrical energy is generated in Idaho by plaintiff on or by its interconnected interstate system or by any part thereof in interstate commerce and deny (a) that said tax act is laid upon any kilowatt hours of electrical energy [fol. 62] generated as property or that the same constitutes or imposes a tax upon property and deny that the same lays a burden upon any interstate commerce; (b) deny that said tax constitutes a burden upon any business of plaintiff or upon any interstate commerce or in any way interferes with or burdens any business of conducting interstate commerce.

Defendants deny that said tax act contains no provision or means for measuring or computing separately the amount of tax due under said act upon electrical energy generated in Idaho and used or consumed in said state and upon energy generated in Idaho and transmitted to points without said state, and deny that any part of the taxes imposed by said act are imposed upon or apply to any interstate commerce.

Deny that plaintiff cannot withdraw from or discontinue its intrastate business in Idaho.

12

Defendants admit that the terms "generation", "manufacture" and "production" as applied to energy in the electrical form are synonymous designations applied to one aspect of the process of transferring energy from some source in nature to some point where it may be usefully applied, to-wit: the process of transforming mechanical energy into electrical energy of new and different characteristics and uses; but deny that the same is merely one aspect of a process of transferring energy, or that the various electrical facilities used in said process are purely transferring devices, and deny that the entire electric system is a device for trasferring the force (as of falling [fol. 63] water) to, and applying it at, the point where it is to be utilized.

Defendants deny that the generation, transmission and use of electrical energy is continuous or simultaneous; admit that at the time of use of electrical energy by the consumer (except for the interposition and operation of transformers as hereinafter set forth) there is a continuous electrical and electro-magnetic path between the windings in the generator and the windings in the consumers' motor (or between the generator windings and the filament in an electrical lamp, or the electrodes in an electro-chemical cell), and admit that the manner of operation of plaintiff's generating stations is such that electrical energy is not generated for customers' use, except as called for by the customer, but deny that except as, and to the extent that, energy is called for and used at the final point of utilization, the electric generator neither receives from the water wheel shaft nor delivers to the electric transmission lines

any energy other than that necessary to hold the equipment under constant rotation and electric charge in instant readiness to serve, but allege that in the operation of plaintiff's generators an amount in excess of the aggregate of the amounts utilized by consumers or by plaintiff is generated, which excess is lost or consumed by the transmission line, sub-stations and transformers of plaintiff's system in the transmission and delivery of such energy, and in the production of the high tension current hereinafter referred to.

Defendants admit that the power, being transferred at any instant along the electric circuit existing between an electric generator and a receiving device, is calculable at [fol. 64] any point as to the power being transferred to such point, from the electrical pressure or voltage between wires and the magnitude and characteristics in the electric currents circulated in the wires, and that such power is commonly expressed in kilowatts; but deny that the amount of electrical energy generated by a generating station is measurable at any point on the circuit between such generating station and the points of utilization of such electrical energy, or at any place other than at such station.

Defendants admit that the "kilowatt-hour" is the usual unit for measuring energy in the electrical form, but deny that the same is a mathematical product of the power relation in the electric circuit between a generator and a receiving device measured in kilowatts and the duration of the time over which that relation is utilized, measured in hours, and allege that the same is the unit of measurement of the amount and volume of electrical energy produced at or delivered to a given point, i. e. the amount of energy which will accomplish, at such point a given amount of mechanical work, or produce a given amount of heat or light.

Defendants admit that in the case of plaintiff's system, and except for station uses, electrical energy is generated only when the combined demand of the customers of plaintiff by means of the operation of the mechanical devices hereinafter referred to, causes the turbine gates in the generating stations to open and thus permits the utilization of the energy of falling water exerted within the

[fol. 65] turbine to operate or drive the generator, and causes the generation or production of electrical energy thereby, but deny that said process of generation constitutes merely a transfer of the energy of the falling water through the electric generator and other parts of plaintiff's electric system to the customer; and further say that such response of production to demand is not inherent in generation, but is obtained by means of mechanical design and auxiliary controlling devices which obviate the necessity of manual control of such turbine gates and permit an automatic regulation of the amount of falling water which must be utilized to accomplish the generation of the required amount of electrical energy.

They admit that such process is practically continuous in its transfer of energy, but deny that the same is absolutely continuous or inseparable, as between the transfer of energy to the generator and the transformation of energy by the generator and transfer therefrom to the customer, or as between the transfer of energy from the generator to the transformer and from the transformer to the point of use.

Defendants admit that each customer's demands or use occurs just as and when the customer desires, and is affected by his act of switching on an electrical appliance or device, and admit that as such demand is made electricity is generated at plaintiff's stations, and that such response in order to the filling of such order is practically instantaneous; but deny that the only energy generated in response to such demand is specifically and solely for such demand and use, and allege the fact to be that an additional amount of electrical energy is required to be, and is, generated in order to permit the production at the transformer and transmission and delivery of the energy required by the customer to his devices and that the electrical current produced [fol. 66] at the generators is not the same current which is delivered to the consumer.

Defendants admit that the demands of plaintiff's various customers in Utah and Wyoming occur in various secondary transmission and distribution lines in said states, which demands are brought partially together through local facilities and consolidated at Terminal station near Salt Lake City, Utah, but deny that there is thus created a continuing combined demand on the Idaho generating stations, or that

such demand exists throughout the Idaho-Utah-Wyoming system. Admit that the incidence of this combined demand as between the several stations on the system, whether in Idaho or in Utah, is, under the control of plaintiff's Dispatcher at Terminal Station, under whose directions the different stations may be placed in readiness for service but allege that such service is in the production of electrical energy, and that under the direction of said dispatcher such switches are opened or closed in the tranmission network of plaintiff or other mechanical devices employed as will cause the generation of the amount of energy or power required by such stations as he may determine, but allege that the electrical current produced at such stations is not transmitted to Terminal Station, but is employed for the production of a new and different current in the transformers, which is transmitted to said Terminal Station.

Defendants deny that power or electricity generated at various Utah stations is transmitted to Terminal Station as the same current generated at such stations; admit that the current transmitted is or may be there com-ingled on common buses with the current transmitted from the transformers operated by power or electricity generated at the Idaho stations, and that between Terminal and the cus- [fol. 67] tomers' point of use, electricity or power can no longer be identified by its source, as in Idaho or Utah. Deny that the actual combined demand effective at Terminal station upon the 130,000 volt transmission line, automatically manifests itself on the various generators previously placed in readiness for service in the production of electrical energy without point of rest between generation and Terminal station. Admit that power or electricity transmitted from the Idaho stations to Utah over the 44,000 volt transmission lines extending from said Grace station, enters in Utah a similar system interconnected with generating stations in Utah, and is distributed thru substations, at which there is a similar loss of identity in Utah as between power generated in Idaho and in Utah.

Defendants deny that the "recording watt-hour meter or meters, or other suitable instrument for measuring the electricity or electric energy produced," which is required by said Tax Act to be maintained "at the point or points of production" on the plaintiff's interconnected Idaho-Utah-Wyoming system, will record, and must record, expressed

in terms of kilowatt hours, the mathematical product of the power relation in the electric circuit between the generators of said system in Idaho and the receiving devices in Utah and Wyoming (as their demands are combined at terminal station), measured in kilowatts, and the duration of time over which that relation is utilized, measured in hours, but allege that such meters or devices record the amount of energy generated at the point of production including, in [fol. 68] the measurement, the energy expended in the system to meet losses and necessary uses incident to the delivery of energy to such receiving devices. Defendants deny that the measurement recorded by such meters is or will be a direct, or any, measure of the magnitude or duration of interstate commerce in electricity or electrical energy over said system, either after said commerce has commenced or during the course thereof.

Defendants deny that the generation of electricity is not the production of a commodity or material thing, and deny that it is a part of the process of rendering a service; deny that no electricity can be commercially generated or produced except as an inseparable part of the service rendered, and deny that the kilowatt hour is the measure of a service, but allege that it is a measure of a commercial commodity.

Defendants allege that the process of generating, manufacturing or producing electrical energy consists essentially of the conversion or transmission of energy in another and different form or state into electrical energy with new and different physical characteristics and new and different uses. The electrical energy so produced may be transported with greater economy and facility than is possible with energy in a mechanical or other form or state; that its employment permits the manufacture and delivery of energy practically instantaneously with the need or requirement of the customer therefor; and that electrical energy is adapted to and may be employed and is commonly used in the operation or use of various mechanical devices or appliances which may not be operated by mechanical power, and that it permits the employment and use of various [fol. 69] devices and appliances with greater flexibility, facility and control than is possible with mechanical or other form of energy, or with an absence of the heat, odor, or noise accompanying the employment of mechanical or other form of energy.

The generation of electrical energy is accomplished by means of certain mechanical devices designed, constructed and operated by man for such purpose, and in such generation is given such definite characteristics, with reference to voltage or pressure, frequency, and its character as direct or alternating current as desired and as may be required by the needs of customers, or the character of the system. These characteristics are variable according to the character of the machinery employed.

Such generation, manufacture or production is accomplished by the utilization of power obtained from burning fuel, or of natural or created sources of water-power. The force of the water or steam pushing against the blades of the turbine wheel causes the turbine shaft to revolve and with it the rotating portion of the electric generator. As a result of the continuous motion of a system of electrical conductors across a magnetic field which is maintained in the generator by separate excitation of its field coils, electrical energy is made available at the stator or stationary part of the generator and consuming devices or appliances may be connected by wires thereto and the energy so generated used at such place.

Plaintiff generates electricity in the form of 60 cycle alternating current, so that the current reverses its direction of flow in the line between generator and the primary coil in the transformer, and in such coil, once every half [fol. 70] cycle. At the instant at which each change of direction is taking place there is a point of time at which there is no current.

In common operations and particularly in the operation of plaintiff's system and generating stations, the electrical energy so produced is conducted, by wires or other metal conductors, to the primary coil of a transformer in close proximity to the generating station. There is no other physical connection between the generator and any part of the transmission system or the devices employed in connection therewith than such wires leading to and from the stator to such primary coil. Said primary coil surrounds an iron core and the alternating current sets up a magnetic flux in such iron core. The transmission line is connected only to the high tension or secondary coil of such trans-

former which surrounds such iron core within the field of force of such magnetic flux, but is insulated from contact with either such primary coil or iron core. The primary coil is connected to a source of alternating voltage; ie., the generator, which tends to force current through the coil, first in one direction, then in the other. With such current flowing through such primary coil an electrical current is induced in such secondary coil and transmitted over the transmission system of plaintiff to points of use. The current so transmitted is a new current of new and different physical characteristics from the current forced through the primary coil by the generator; and which may be transmitted considerable distances with less loss of energy. The [fol. 71] amount of power that flows with any given current is proportioned to the voltage.

Similarly, the current transmitted is not in most instances the current delivered to the consumer, but by the interposition of other transformers a current of lower voltage than that transmitted (and of lower voltage than that produced at the generator) is induced in the transformer coils connected to the distribution lines and delivered to consumers.

Such electrical energy is a commercial commodity and is sold and delivered to customers without regard to the character of use to which it is or may be put by such customer, or the various appliances, devices or machines to be operated by him, and the vendor is without control over the character of use to which such electrical energy is put by the customer.

The amount of energy generated is controlled by generator design and the operation of auxiliary controlling devices and equipment. In both generation and sale the amount of energy produced or delivered is capable of exact and definite measurement.

Plaintiff's generating stations in Idaho are located at such points in Idaho as enable it to utilize the power in falling water taken from the streams and watersheds of Idaho, or utilized in such streams at a point where there is naturally or may be created by artificial means a waterfall of sufficient power to turn the generators, in lieu of power obtained from burning fuel. The water power and the [fol. 72] water so utilized by plaintiff is a natural and valuable resource of the State of Idaho and of use for the pro-

duction of hydro-electric power valuable and necessary to the development of the state; and such right of use is of great industrial and commercial value as a property right. Both the water and water power which is or may be made available for hydro-electric power within the State of Idaho, and particularly within the region in which plaintiff operates is limited in amount. Such right of use is not subjected to any ad valorem taxes by the state or any political subdivision, or to any tax except as may be imposed by the tax act herein referred to. The right to the use of such resources is had and enjoyed by plaintiff under permit and license of the state without payment of other than nominal fees and charges incident to the proceedings provided by law for the procurement of a license for such use. In the actual operations of plaintiff's system large volumes of water are annually diverted from the streams and lakes of Idaho into other channels than those in which the same would naturally and otherwise flow, and from which channels the same cannot be diverted for the irrigation or reclamation of lands in Idaho upon which the same could otherwise be applied. Idaho is an arid state, and said lands require the use of water, artificially applied, in order to the cultivation of said lands and the production of crops thereon. The *affect* of such diversion and use by plaintiff is to prevent the cultivation of large bodies of land which would thereby become of great value to the state and to render the same worthless. The character of the electric energy generated at said Idaho stations of plaintiff is such [fol. 73] that the same may be delivered and sold in barter, sale, or exchange, and used, at or in the vicinity of the plant, or at or to any other places in Idaho within a radius of two hundred miles or more, where customers and uses and markets may be found or developed therefore, or to demands from industries or uses which may hereafter be developed in such territory. As between different points of use its delivery is determined by the employment and operation of transmission lines, and not by the character or operation of any machinery at or in the generating station.

13

Defendants deny that said Tax Act violates the 14th Amendment of the Constitution of the United States or

that it denies to plaintiff the equal protection of laws in the business of generating or producing electrical energy in the State of Idaho, or that it permits or renders plaintiff's property liable to be taken without due process of law, and deny that any of the penalties fixed by said Act for failure to comply with the provisions thereof are so excessive as to intimidate or coerce or compel plaintiff or any person to comply with the provisions thereof without the freedom of resorting to the courts to test the validity of the provisions of said Act, or that such penalties are in any way excessive or in any way intimidate, coerce or compel plaintiff or any person to do anything.

14

Defendants deny that said Tax Act denies to plaintiff equal protection of the law or renders its property liable to [fol. 74] be taken without due process of law or that the said Act appropriates any money of plaintiff or requires the payment of any money of plaintiff for the benefit of any private individual.

15

(A) Defendants deny that the said tax act violates the Constitution of the State of Idaho in any manner or is in conflict with Article III, Section 16 of said Constitution, and particularly:

1. Deny that the title to said act or the act contain more than one subject, or contain any subject other than the levying of a license tax for the revenue purposes and matters intimate to and connected therewith, and allege that the provision for application of credits on the bills of certain customers of electricity is a provision for an exemption from said tax act, as referred to in such title, and no more;

2. Deny that the subject of said act is not expressed in the title and deny that said act purports to levy or levies any tax upon the producer of electrical energy based on or measured by all kilowatt hours generated, manufactured or produced by him, or upon other electrical energy than that produced for barter, sale or exchange, as referred to in such title;

3. Deny that the subject of said act is not expressed in the title thereto in that the quantity of electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho is in anywise different from, or less than, the energy which would have been taxable at the place of production had not such energy been exempted under the provisions of said act.

[fol. 75] (B) Defendant deny that said act in exempting from tax the electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho, and providing that a sum equal to the tax that would otherwise be paid by the producer shall be credited on the power bill of the consumer:

(1) Violates Section 13 of Article I of the Constitution of Idaho, or in anywise deprives plaintiff of any property without due process of law;

(2) Violates Article VIII, Section 2, and Article VII, Section 2, of said Constitution or in anywise constitutes the levying of a tax for other than a public purpose, or constitutes the levying of a tax for the benefit of any individual;

(3) Imposes a tax for the benefit of any irrigation district or any municipal corporation, or in anywise violates Article VII, Section 6 of said Constitution.

(C) Defendants deny that the tax imposed by said act constitutes a second license tax imposed upon the plaintiff for the privilege of doing business within this state, as set forth in Subdivision b, Paragraph 9 of said Bill of Complaint, and allege that such corporate franchise tax as therein referred to is imposed upon plaintiff for the privilege of doing business as a corporate entity and without respect to the character of business engaged in or the conduct of any business, and that the tax imposed by the act here in question is an excise tax levied and imposed upon the production, generation or manufacture of electrical energy and solely related thereto, and without regard to the character of entity engaged in such generation and production; [fol. 76] and deny that said tax in anywise violated Article VII, Section 2 of said Constitution, or that such tax extends to any business done without the State of Idaho.

(D) Defendants deny that said act violates either Section 2 or Section 5 of Article VII of said Constitution. They deny that the same is a property tax or a tax upon a kilowatt hour as property or otherwise, or upon any property; but allege that the same is an excise tax, the amount whereof is based upon or measured by the number of kilowatt hours of electrical energy generated or produced by the producer in Idaho for barter, sale or exchange; and that the incidence thereof is upon the producer and not upon any property.

(E) Defendants deny that said Extraordinary Session of the Legislature was called in violation of the provisions of Section 9 of Article IV of said Constitution, or that no "extraordinary occasion" existed justifying the calling of said session, or that said session was called for the purpose of considering matters that had theretofore been considered at the Regular Session of the Legislature; and further allege that the act of calling such Extraordinary Session was a right and power vested by the Constitution of the State of Idaho in the discretion of the governor of said state, and that at the time of convening such session an extraordinary occasion or condition existed as to tax problems and the distribution of tax burdens within the State of Idaho.

[fol. 77] 16

Defendants deny that said act contains any uncertainties or ambiguities or that the provisions thereof cannot be certainly or definitely or equitably levied against plaintiff upon the basis of the number of kilowatt hours of electrical energy by it manufactured, generated or produced for barter, sale or exchange; deny that any taxes are levied on any kilowatt hours; and deny that:

(a) It cannot be determined from said act where a tax is to be levied on all kilowatt hours generated or produced in the State of Idaho, including those used in the taxpayers' own operations, but allege that such act provides for a tax to be measured by kilowatt hours of electrical energy produced for barter, sale or exchange.

(b) Defendants allege that the penalty of interest from due date at the rate of 10 per cent per annum, provided by

Section 2 of said act, is additive and supplemental to the penalty of three times the amount of the unpaid or delinquent tax provided by Section 8 of said act.

(c) Deny that the amounts provided by Section 5, of said act to be credited upon the power bills of consumers for irrigation pumping is in anywise different from or greater than the amounts exempted from tax because furnished to such irrigation pumping uses; or that any computation of such credits will include or be affected by any transmission losses.

And deny that any enforcement of said act will deprive plaintiff of any property without due process of law.

[fol. 78] 17

Defendants deny that said Tax Act is in anywise invalid, and deny that plaintiff will suffed irreparable injury or be subjected to a multiplicity of suits or be threatened with any heavy or severe penalty, and deny that plaintiff has no plain, adequate and complete remedy at law. Defendants deny that the penalties provided by said act are so unreasonable, burdensome or excessive that plaintiff could not safely refuse to pay the tax as same is demanded, or that any of such penalties are unreasonable, or burdensome or excessive.

Wherefore defendants pray judgment that the Bill of Complaint of plaintiff be dismissed, with costs to defendants.

Fred J. Babcock, Attorney General for Idaho; Sidman I. Barber, Assistant Attorney General; Maurice H. Greene, Assistant Attorney General, Solicitors for Defendants, Residing at Boise, Idaho.

[fol. 79] *Duly sworn to by Emmitt Pfost. Jurat omitted in printing.*

[fol. 80] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT, DISTRICT OF IDAHO, SOUTHERN DIVISION

No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff,

vs.

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, Defendants

Hawley & Worthwine, of Boise, Idaho; Merrill & Merrill, of Pocatello, Idaho (Geo. R. Corey, of Salt Lake City, Utah, and John H. MacLane, of New York City, New York, of Counsel), for plaintiff, Utah Power & Light Company.

Fred J. Babcock, Attorney General of Idaho, and Sidman L. Barber and Maurice H. Greene, Assistants Attorney General, for defendants.

Before Sawtelle, Circuit Judge, and Webster and Cavanah, District Judges, as a Statutory Three-judge Court

MEMORANDUM OPINION—Filed December 30, 1931

CAVANAH, District Judge:

In the original opinion of the court rendered on August 20th, 1931, on the motions to dismiss and for an interlocutory injunction we considered and disposed of all questions presented, excepting the remaining one of fact as to whether the tax imposed by the Act was in its application to the plaintiff, a burden on interstate commerce, as there appeared from the bill and the affidavits filed a real controversy over material questions of fact which could not [fol. 81] have been satisfactorily determined by the bill and affidavits, so a Master was appointed to take the testimony and report the same without findings or recommendations of decree. The case is now again before the court upon the testimony for a final determination of the issue thus stated.

The purpose of the legislative Act in question is not in any manner to infringe on interstate commerce, but is to

require the payment of a license tax upon all electricity and electrical energy generated in the state of Idaho for barter, sale or exchange. It is limited to such electricity and electrical energy as is generated in the state and applies to the practical operations of those systems from which it can be determined the amount of electricity and electrical energy so generated as it requires the payment of ½ mill per kilowatt hour on all electricity and electrical energy so generated and produced in the state, measured at the place of production by the installation at the point of production by the producer of recording watt hour meters or other suitable instruments of a type to be approved by the Commissioner of Law Enforcement, although such electricity and electrical energy may in part enter its journey in interstate commerce. Under the Act the determination of the amount of electricity and electrical energy must be measured at the place of production and is based on the number of kilowatt hours.

Our cruic-al question, therefore is: Does the Act when applied to the practical operation of the plaintiff's electrical system infringe upon the commerce clause of the constitution? The principle applicable to this inquiry is as stated in our original opinion that where the production and delivery of the product is esesntially local in character and not essentially national and the local interest is paramount, the question as to whether it actually burdens interstate commerce must be determined from the various circumstances in each case. The movement of the com-
[fol. 82] modity for another state must have actually begun and is going on and the character of the transportation depends upon the circumstances looking to what the owner had done in preparation for the journey and in carrying it out. Turning then to the evidence and testing it by this rule a brief summary of it is indispensable to fully understand the nature of the plaintiff's operations. The manner of production and place of origin of the electricity and electrical energy generated by the plaintiff is testified to by some of the most noted engineers and physicists of the country, and, as usual among experts, there appears a difference of opinion relating to the practical and scientific view.

The weight of the evidence discloses that the plaintiff is engaged in the generation, transmission, delivery and sale

of electrical power and energy to its consumers, in the states of Idaho, Utah and Wyoming delivered at the point where the company's wires or apparatus are connected with those of the consumers, and the total energy generated by it at all of its Idaho stations for the year 1930 was 233,253,000 kilowatt hours, of which 199,968,000 kilowatt hours were generated at its Beaver River station in Idaho, and 33,285,000 kilowatt hours were generated at its other Idaho stations. Of the kilowatt hours so generated 6,978,000 kilowatt hours were its station use at Idaho stations and 24,046,000 kilowatt hours delivered to its Idaho consumers and its use at its division offices, and 198,502,000 kilowatt hours for transmission to Utah. The measured output of the Beaver River station in Idaho is 161,649,000 kilowatt hours. There are meters placed in the several stations showing the output in kilowatt hours and the amount of electrical power or energy delivered to the consumers is measured by meters at the consumers point of use. At the generating stations the amount of energy generated and the output to the transmission lines is measured as the plaintiff has determined that fact in kilowatt hours by meter [fol. 83] measurements from the generator to the transmission line. The essential apparatus interspersed in the system to accomplish the transfer of the energy from the falling water to the place of use are generators, transformers, and transmission lines. The generator is a device for converting mechanical energy into electrical energy and by which the energy drawn from the water is changed from one form to another and passed along. The transmission losses are dependent upon the transmission system—not upon the generating system and can be determined by the instal-ation of meters on the line of the system at various parts of it under given conditions. Energy for commercial purposes may be measured by meters placed outside of the generators, which is the first place at which energy transferred through the generator may be measured. These meters measure the energy flowing past the point at which the meter is connected, and the amount of the enrgy which reachs the transformer can be accurately measured at any point on the line and which is done as a commercial operation. The dispatcher at the stations by opening or closing of the different switches can direct the output of a certain station available to consumers over that

transmission net work. While there appear differences of opinion among the engineers, and scientists as to whether the generation of electrical energy can be determined at the place of production and before it reaches the point of use, yet we are impressed with th view expressed by those who have testified that it can be measured and the amount accurately determined by the instal-ation of meters or other proper instruments at the place of production, and especially is that true when we consider the testimony of Mr. Hale, the chief engineer of the plaintiff to the effect that in the operation of the system the plaintiff determines with accuracy its meter number of kilowatt hours of energy generated by it in Idaho at its various generating stations and before it starts in transmission on its journey to Utah [fol. 84] and Wyoming. This actual fact that the plaintiff is by its meters determining the number of kilowatt hours of the electrical energy at its generating stations in the State of Idaho, does without doubt, dispose of the contention made by the plaintiff that electrical energy cannot be measured and determined at the generator and before it is transmitted to the consumers. The witness, Rupp who qualified and ventured an opinion, says that the amount of electrical energy delivered can be measured at any point on the line of the system. If then the energy can be measured and determined at its place of production, being the generator, or anywhere on the line before it enters upon its journey in interstate commerce, it is quite clear that the production of the energy in the manner in which plaintiff is doing, is essentially local in character and not essentially national, although it is in part thereafter transmitted in interstate commerce. What the plaintiff is doing in the first instance is generating electrical energy from one of the natural resources of the state, the falling water, and the fact that thereafter it transmits and sells it both in and out of the state does not burden interstate commerce upon the principle recognized by the Supreme Court.

We must not forget the fact that the generator makes the energy available in the form as electrical energy but as generated it cannot be transmitted over the system. The transformer seems necessary in preparing it for its final journey through the induction of a current of higher voltage, as it is used to raise or lower the voltage with corresponding decreases or increases in current. So genera-

tion of energy preceeds transmission and use as it must first be converted into electrical energy, a process complete before the pulses of energy leave the generator in their flow to the transformer.

The tax provided for by the Act is not measured by the amount of electrical energy transmitted nor by the amount [fol. 85] sold or used, but solely by production, regardless of where delivered and sold, as the Act expressly provides that in the generation of electricity and electrical energy for the purposes mentioned in it the ones who do so shall pay the tax of ½ mill per kilowatt hour on the amount of such electricity and electrical energy so produced and not the amount used. We cannot yield our assent to the interpretation of the Act as given by counsel for the plaintiff when applied to the operations of plaintiff's system, that the amount of kilowatt hours generated can only be measured by meters at the points of use of customers in Utah. For as has been said the plaintiff has determined that fact by its meters at its generation stations in Idaho for it has given the exact number of kilowatt hours of energy generated at such stations and pleaded specific amounts of "sales in Idaho", "transmission, distribution and sub-station losses pending its business in Idaho", and "station use in Idaho for plaintiff's own purposes and not for barter, sale or exchange". Counsel for plaintiff have confused the word "production" of energy expressed in the Act with transmission, use and delivery, and their contention that the energy transmitted and delivered to Utah consumers for barter, sale or exchange must be measured there and determined on data assembled from readings taken in Utah, cannot be sustained when we remember that the Act relates only to energy "produced" in the state of Idaho, which can be determined under the testimony, at "places of production" and before it is transmitted to the foreign state. The process of generating the energy is complete within the State of Idaho. The tax is not one, when applied to kilowatt hours used by Utah consumers, upon the use because the amount of energy produced may be determined at the generator and before it reaches the Utah state line. It is nothing more than a tax upon an article produced within the state which thereafter is in part transmitted in commerce. The fact that the production is in

part designed for interstate commerce is immaterial, Heisler v. Thomas Colliery Company et al. 260 U. S. 245. [fol. 86] Nor is the fact that the production is in response to orders for delivery without the state controlling or, its production for interstate commerce itself such commerce. Oliver Iron Mining Co. v. Lord et al. 262 U. S. 172; United Mine Workers of America, et al. v. Coronado Coal Co. et al. 259 U. S. 344; United Leather Workers v. Herkert & Meisel Trunk Company et al., 265 U. S. 457.

To the non-technical mind the record here convinces us that there should be no difficulty in determining to a practical certainty how much electrical energy is generated at plaintiff's generating stations in Idaho, for as has been said, the plaintiff seems to be determining that fact with accuracy by the manner in which it is operating its system.

The thought advanced by the court in the case of South Carolina Power Co. v. South Carolina Tax Commission, recently decided and unreported, where the same question is as to the application of a similar statute to power companies claiming to be doing interstate business, impresses us as a further reason why the Act here when applied to the practical operations of plaintiff's system does not burden interstate commerce. The court in that case had before it the affidavit of Dr. Millikan, who has testified here in effect the same as what is set forth in his affidavit considered in that case, and the conclusion was there reached that the functions and operations of the transformer in the electrical processes are essential and are resorted to in order to a practical operation of the transmission lines, and that the energy generated in the generator could be determined before it was transmitted over the line into the foreign state.

In principle and the facts considered in the cases of Hope Natural Gas Co. v. Hall, et al. 274 U. S. 284; Oliver Iron Mining Co. v. Lord 262 U. S. 172; Heisler v. Thomas Colliery Co. 260 U. S. 245, would seem to give support in upholding the tax here.

In the case of Hope Gas Co. v. Hall et al., supra, the plaintiff, who was engaged in the production of natural gas in West Virginia, and the transportation of it through [fol. 87] pipe lines direct from its wells into the states of Pennsylvania and Ohio, where it was delivered and sold, sought an injunction against the enforcement of a tax act

of West Virginia, requiring it to pay a tax on the natural gas produced within the state and before it entered interstate commerce. It seems that most of the gas passed into interstate commerce by continuous movement from the wells. It was urged that the Act burdens interstate commerce, and also to enforce it would deprive plaintiff of property without due process of law, and deny equal protection of the laws. The highest court of West Virginia held that the Act was valid but required that the value of the gas be computed upon its value at the well and not otherwise. The Supreme Court affirmed the decision of the West Virginia court, and held that the ratio of the tax, being the entire production in the state regardless of the place of sale, or that deliveries may be made to points outside of the state, is not unconstitutional as respects gas transported to and sold in other states, since the highest court of West Virginia had held requiring the tax to be computed on the value of the gas at the well before it enters interstate commerce. The Act here requires that the tax be computed on the amount of electricity and electrical energy at the place of production within the State of Idaho.

And again the Supreme Court has said in Oliver Iron Mining Co. v. Lord et al., supra, the plaintiff was engaged in the business of producing iron ore from mines within the State of Minnesota and the legislature of that state enacted a law requiring it and all others who were engaged in such business to pay a tax equal to 6 per cent of the value of the ore produced in each year. The chief contention made by the plaintiff was that mining as conducted by it was so connected with interstate commerce that to tax it is to burden such commerce, and such contention rested upon the fact, that the demand or market within the state for iron ore [fol. 88] covered only a negligible percentage of what was mined, as practically all of their output was mined to fill contracts with consumers outside of the state and passed at once into the channels of interstate commerce. There was practically a continuity of movement from the time the ore was severed from its natural bed until it reached the consumer in the foreign state. The court reached the conclusion that the facts did not support plaintiff's contention, as mining was not interstate commerce, but, like manufacturing, is a local business subject to local regulation and

taxation, and said "The ore does not enter interstate commerce until after the mining is done, and the tax is imposed only in respect of the mining. No discrimination against interstate commerce is involved. The tax may indirectly and incidentally affect such commerce just as any taxation of railroad and telegraph lines does, but this is not a forbidden burden or interference." So here the production of the energy is not interstate commerce for it is produced and its production is completed and the amount thereof can be actually determined at the "place of production" within the state of Idaho and the tax reckoned according to the amount of it at the generator. American Manufacturing Company v. City of St. Louis 250 U. S. 459; Oliver Iron Mining Co. v. Lord, supra. Under the facts in this case the plaintiff should not treat the amount of energy reaching consumers outside of the state as the amount of the energy produced within the state, and before it enters interstate commerce.

The principle that the legislature of the state may require those who produce a commodity in the state for sale to pay a tax upon the amount produced and to keep a record thereof before the commodity starts on its journey in interstate commerce, has frequently been upheld in the light of the facts apparent in each case. The tax here is not laid on [fol. 89] the transportation of subjects of interstate commerce or on receipts derived therefrom, but merely on the production of electrical energy generated and determined within the state from one of the natural resources of the state. The Act does not, when applied to the manner in which the plaintiff operates its electrical system, burden interstate commerce, nor is it in conflict with any express enactments of Congress on the subject, nor contrary to any intention of Congress to be presumed from its silence.

Entertaining these views we believe there should be a decree for the defendants to the effect that the interlocutory injunction heretofore granted be dissolved and that the tax required by the Act with interest and costs of suit be paid by the plaintiff to the State of Idaho, less the penalty provided for in the Act during the pendency of the action.

[fol. 90] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

MOTION OF PLAINTIFF TO MAKE AND ENTER FINDINGS OF FACT AND CONCLUSIONS OF LAW—Filed Jan. 15, 1932

Comes now the plaintiff, Utah Power & Light Company, a corporation, and moves the above entitled Court to make and enter the following Findings of Fact and Conclusions of Law, to wit:

Findings of Fact

I

The first seven paragraphs of the Bill of Complaint are admitted to be true by the amended answer of the defendants and, therefore, found to be true by the Court, save and except it is denied by the defendants that the plaintiff is or has been engaged in generating any electrical power or energy in interstate commerce between states and that the controversy arises under the Constitution of the United States, and that the defendant Commissioner will construe the Tax Act, hereinafter referred to, to apply to all electricity produced by the plaintiff but only to such as is produced for barter, sale or exchange. With respect to the disputed allegations in said paragraphs the Court finds that the plaintiff, Utah Power & Light Company, a corporation, is engaged in the business of generating, transmitting and distributing electrical energy as a public utility within the States of Idaho, Utah and Wyoming; that the facts [fol. 91] relating to interstate commerce are as hereinafter recited. A controversy in this case arises under the Constitution of the United States. The defendants are charged with the duty of enforcing the provisions of that certain Tax Act passed by the Legislature of the State of Idaho in Extraordinary Session March 17, 1931, by the terms of which a tax of one-half mill per kilowatt hour is sought to be imposed upon the producer of electricity generated or produced within the State of Idaho for barter, sale or exchange. The defendants have prescribed forms and have

notified the plaintiff that it must pay such tax as provided for in said Act without regard to whether or not said electrical energy is consumed within or without the State of Idaho and irrespective of transmission uses, but not including such electrical energy as is used by the plaintiff in station uses.

II

The plaintiff owns and operates an interconnected electric power system consisting of generating stations, transmission and distribution lines, and other electrical equipment located in the States of Idaho, Utah and Wyoming, which system is operated as a unit, whereby energy in the electrical form is generated, transmitted, distributed and delivered, in barter, sale and exchange, to its customers in each of said states, including, but not limited to, persons, firms, corporations and irrigation districts, pumping water by electricity for irrigation purposes, to be used on lands in the State of Idaho and in interstate commerce between said States of Idaho, Utah and Wyoming. As part of said interconnected system, plaintiff owns and operates several hydro-electric stations located in the State of Idaho, consisting of certain stations on the Bear River known as Soda, Grace, Cove and Oneida.

[fol. 92] During the year 1930 there was generated or produced in and by that part of said system located in Idaho, in conjunction with said interconnected system, electricity measured through integrating watt hour recording meters in terms of 233,253,000 kilowatt hours, of which 199,968,000 kilowatt hours were generated at its Bear River stations in Idaho, and 33,285,000 kilowatt hours were generated at its other Idaho stations. Of the kilowatt hours so generated, 6,978,000 kilowatt hours were used for its station uses at Idaho stations, and 24,046,000 kilowatt hours were delivered to its Idaho consumers and its uses at its division offices, and 198,502,000 kilowatt hours for transmission to Utah. The measured output of the Bear River stations in Idaho to the 130,000 volt transmission lines were 161,649,000 kilowatt hours.

That the electricity, so generated and transmitted from Idaho to the States of Utah and Wyoming, subject to transmission and distribution losses or uses of approximately

twenty per cent, was sold by plaintiff in the States of Utah and Wyoming under contracts, theretofore entered into between said Company and its customers in said states, and the generation and transmission of said electricity to the customers of the plaintiff in the said States of Utah and Wyoming was necessary for the performance of said contracts with said customers.

The Soda, Grace, Cove and Oneida stations, located in Idaho, have a combined capacity of 95,500 kilowatts and are connected directly to three 130,000 volt transmission lines extending directly from said stations through Idaho to a station named "Wheelon" in Utah, and thence to a receiving and switching station named "Terminal" near Salt Lake City, Utah. There is no use of electricity from [fol. 93] said 130,000 volt lines in Idaho, the first use therefrom being at Wheelon, Utah, and the principal use of said electricity being at points in Utah and Wyoming after the same has passed through said Terminal station.

The local customer uses in Idaho from the Idaho stations, last above mentioned, are from separate outgoing lines segregated at the generating bus. Approximately two per cent. of the energy generated at said stations goes to serve local customers in Idaho. The local customers uses in Idaho have been connected to said stations merely to gain economy and service convenience, which, except for these major stations, would be impracticable. In addition to electricity transmitted over said 130,000 volt lines, some electricity from said stations also reaches Utah over 44,000 volt lines from the Grace station.

The operations described for the year 1930 are similar to and descriptive of plaintiff's operations as the same are now practiced during 1931, and plaintiff's operations in the future will be substantially the same and in substantially the same proportions as between intrastate and interstate commerce.

III

The Court finds that the plaintiff's "Bear River System" was constructed primarily for the purpose of generating electricity for use in the State of Utah, and that since its construction it has been used almost solely for the purpose of generating electricity which passes without interruption from the Idaho plants on the Bear River to the consumers in Utah and Wyoming and substantially all of

the patrons of the plaintiff who use electricity from these plants do so under contracts with the plaintiff, which contracts are made and fulfilled outside the State of Idaho.

[fol. 94]

IV

Upon the above described property, and in connection with its business aforesaid, plaintiff has been and will continue to be required to pay annually, taxes imposed under the general tax laws of Idaho, as follows:

(a) A general property tax levied annually upon all property, real and personal, of the plaintiff, situated within the State of Idaho, in proportion to its value, in common with all other property in the State not exempt from taxation. Plaintiff has paid such general property tax upon its property in Idaho annually; this tax for the year 1930 amounted to $412,090.07, and was based upon an assessed valuation of $11,088,009.00; and a like assessment will be made and a like tax levied and paid for the calendar year 1931, and in subsequent years.

(b) An annual license tax for the right to do business in Idaho as a corporation based upon plaintiff's authorized capital stock, which tax plaintiff has paid annually since its incorporation and qualification to do business in Idaho.

(c) An income tax, effective July 1, 1931, levied and collected upon the net income of plaintiff in Idaho.

None of the foregoing tax laws under which the taxes enumerated in this paragraph are levied and assessed against the plaintiff, have been repealed and all remain in full force and effect.

V

In addition to the taxes aforesaid levied against and collected from the plaintiff, another tax is sought to be imposed and levied against the plaintiff by virtue of said Tax Act. Plaintiff, in the year 1930, generated or produced within that part of its interconnected system located in Idaho, electricity measured in terms of 233,253,000 kilo-

[fol. 95] watt hours, and for the year 1931 and thereafter will generate or produce approximately a like amount of electricity in said State upon said system. Under said Tax Act and in accordance with the interpretation placed

thereon by the Commissioner, plaintiff would have paid for the year 1930, had said Tax Act been then effective, an amount in excess of $100,000.00. The gross business of the plaintiff in Idaho for the year 1930, from the production and sale of electricity within said State, amounted to approximately $735,000.00, and will continue in approximately that amount annually hereafter.

VI

The tax imposed by said Tax Act is a license tax upon the producer and no provision is made in said Tax Act for measuring or computing separately the amount of the tax as applied to such electricity as might be used in Idaho as distinguished from that used in Utah and Wyoming. The plaintiff cannot withdraw from or discontinue its Idaho business.

VII

The terms "generation", "manufacture" and "production" as applied to energy in the electrical form are merely synonymous designations applied to one aspect of the process of transferring energy from some source in nature (such as falling water) to some point where it may be usefully applied. The various electrical facilities used in said process are purely transferring devices, and the entire combined process—electric, magnetic and mechanical—is integral, continuous and essentially simultaneous, as electricity travels with the speed of light—one hundred and eighty-six thousand miles per second of time.

[fol. 96]

VIII

There is a continuous electrical and electro-magnetic path between the windings in the generator and the windings in the consumer's motor (or between the generator windings and the filament in an electric lamp or the electrodes in an electro-chemical cell). The entire electric system is a device for transferring the force (as of falling water) to, and applying it at, the point where it is to be utilized.

IX

The Court further finds that in the case of the plaintiff's system "electricity and electrical energy", described in the

Tax Act, is "generated, manufactured or produced" only if, as and when the combined demand of its customers in Utah and Wyoming, causes the turbine gates of the Idaho generating stations to open, thus permitting the energy of the falling water exerted within the turbine to be instantly transferred through the electric generator and other parts of the interstate electric system to the customers motors, lights or other equipment. Each customer's demand occurs just as and when the customer desires, and is effected by his act of switching on lights, motors, ranges and other electric appliances. As the demand is made, the electricity demanded is instantly, and as an immediate and direct result of said demand, generated at plaintiff's said stations specifically and solely for, and in response to, that demand and use. The demands of the plaintiff's various customers in Utah and Wyoming occur on various secondary transmission and distribution lines in said States, which demands are brought partially together through local facilities and [fol. 97] completely consolidated at Terminal Station, near Salt Lake City, Utah. There is thus created a continuing combined demand on the Idaho generating stations which exists throughout the Utah-Idaho-Wyoming system. The incidents of this combined demand as between the several stations on the system, whether in Idaho or in Utah, is, within the limits of the effective capacity of the several stations, under the control of plaintiff's dispatcher at Terminal Station, under whose directions the different stations may be placed in readiness for service. Power or electricity generated at the various Utah stations is likewise transmitted to Terminal Station and there commingled on common buses with power or electricity generated at the Idaho stations. Between Terminal and the customer's points of use, electricity or power can no longer be identified by its source, as in Utah or Idaho. The actual combined demand effective at Terminal Station upon the 130,000 volt transmission line, automatically manifests itself on the various generators previously placed in readiness for service, in the manner hereinbefore described, without point of rest between generation and Terminal Station. Similarly, power or electricity transmitted from the Idaho Stations to Utah over the 44,000 volt transmission lines extending from Grace Station enters in Utah a similar system

interconnected with generating stations in Utah, and is distributed through substations to which there is a similar loss of identity in Utah as between power generated in Idaho and in Utah.

X

The entire process of generation, transmission and use of electrical energy on the plaintiff's system is a continuous, inseparable transfer of energy from the falling water, through the generators, transformers, along the transmis- [fol. 98] sion lines, to the customers' points of use in Utah and Wyoming the transfer of which electrical energy is at a rate of speed of approximately one hundred and eighty-six thousand miles per second of time.

XI

There is an absolute interdependence of the consuming devices upon the generator and there can be no generation of electrical energy upon the plaintiff's system except as and to the extent that such energy is called for and used at the final point of utilization other than that absolutely necessary to hold the electric generator under constant rotation and electric charge in instant readiness to serve.

XII

The difference in amount of electricity generated and that actually used by the consumer constitutes line uses and is necessary and essential in the process of generating, transmitting and using electricity.

XIII

The Court finds that electrical energy or "kilowatt hours" produced or generated upon the plaintiff's system and in the plaintiff's generators cannot be stored or reservoired or detained, but is used by the consumer instantly with its generation. There is no point between the generation and the use of said electrical energy where the same is detained or brought to rest.

XIV

The power being transferred at any instant along the electric circuit existing between an electric generator at one place and a receiving device at another place is calculable at

any point in the circuit from the electrical pressure or volt-
[fol. 99] age between wires and the magnitude and characteristics of the electric current circulating in the wires, and is commonly expressed in kilowatts.

XV

The "kilowatt hour", the usual unit for measuring energy in the electrical form, is a mathematical product of the power relation in the electric circuit between a generating and receiving device, measured in kilowatts, and the duration of time over which that relation is utilized, measured in hours.

XVI

The "recording watt hour meter or meters, or other suitable instrument for measuring the electricity or electrical energy produced," which is required by said Tax Act to be maintained "at the point or points of production" on the plaintiff's interconnected Idaho-Utah-Wyoming system, will record, and must record, expressed in terms of kilowatt hours, the mathematical product of the power relation in the electric circuit between the generators of said system in Idaho and the receiving devices in Utah and Wyoming (as their demands are combined at Terminal Station), measured in kilowatts, and the duration of time over which that relation is utilized, measured in hours, including, in the measurement, the energy expended in the system, to meet losses and other necessary uses incident to the delivery of energy to such receiving devices.

XVII

The measurement of electrical energy upon which the tax is sought to be imposed by said Tax Act is, and will be, a direct measure of the magnitude and duration of interstate commerce in electrical energy over said system, after said commerce has commenced and during the course thereof.

[fol. 100]

XVIII

The generation of electricity is not the production of a commodity or material thing; it is a part of the process of rendering a service, and no electricity can be commercially generated or produced except as an inseparable part of the

service rendered. Likewise the "kilowatt hour" is the measure of such service and not a measure or unit of material things.

XIX

The Court further finds that there is a marked distinction between electric current and electrical energy or power; that electric current is the carrier for electric power or energy; electric current is not used or consumed by the consumer but returns again to the generator, leaving behind the electric energy or power which is used or consumed by the consumer. Electric current is never bought or sold; it is the electrical energy which is purchased by the consumer. Electric current is measured in amperes while electric energy is measured in kilowatt hours—two distinct quantities, not convertible into each other, nor expressible in terms of each other.

XX

The function of a transformer in a hydro-electric system like that of the plaintiff is to transform current and voltage such as to give it higher or lower pressure. It does not in any respect affect or change the power or electric energy. Its use is purely an economic one. It plays a role similar to that of a set of reduction gears and affects solely the electric current, while the same electrical energy or power which comes from the generator passes through the transformer without change in its physical or other characteristics and that energy which is purchased and used by the consumer is the same energy which leaves the generator [fol. 101] and passes through the transformer, along the transmission lines to the consumer's device.

XXI

The electrical energy, which is required to be measured by said Tax Act in terms of kilowatt hours, is precisely the same energy whether it is measured after it leaves the generator and before it enters the transformer or measured at any other place along the transmission line between the generator and consumer's device and said measurement cannot be made at any point except as and when the electrical energy is in motion and passing to its destination.

XXII

The Court further finds that the generation, transmission and use of electrical energy is an integral inseparable process and this process is inseparably connected with the fulfillment of contracts for service between the plaintiff and its various customers in Utah, Wyoming and Idaho; that the Tax Act considered in this case cannot operate as against the plaintiff except that it burdens the commerce in electrical energy between the States of Utah, Idaho and Wyoming.

XXIII

With respect to the issues formed by the allegations of Paragraph 13 of the bill of complaint and the amended answer of the defendants thereto, the Court finds that the penalties prescribed in said Tax Act are not necessarily involved in this suit as no attempt is now being made to enforce said penalties, and the Court further finds that no penalties will be imposed against the plaintiff under said Tax Act for the period pending the final determination of this cause either here or upon appeal and that the provisions of said Tax Act relating to penalties are separable from the other provisions of the Act and, if held to be unconstitutional, would not affect the validity of the Act as a whole or any provision not specifically connected with said penalties and, therefore, in advance of any attempt to enforce such penalties, the Court declines to pass upon the validity thereof.

[fol. 102]

XXIV

The Court finds that Section 5 of said Tax Act compels an appropriation and payment of money of the plaintiff for the sole and exclusive benefit of private individuals and corporations, to wit: those using electrical energy for pumping water for irrigation purposes, without compensation to the plaintiff therefor. The Court further finds that the effect of the Act is different according as Section 5 is held to be valid or invalid. Section 5 is, therefore, inseparable from the balance of the Act and the Court cannot determine from the Act whether or not it would have been passed by the Legislature had said Section 5 not been included therein.

XXV

With respect to the issues raised by Paragraph 15 of the Bill of Complaint and the Amended Answer of the defendants thereto, the Court finds as follows:

A

1. Both the Title and the Act contain two subjects, that is (a) the levying of a license tax for revenue purposes; and (b) the application of credits on the electric bills of certain consumers of electricity.

2. The subject of the Act is not expressed in the Title in that the Title purports to levy "a license tax of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange", whereas the Act purports to levy upon the producer of electrical energy for barter, sale or exchange a tax of one-half mill on all kilowatt hours generated, manufactured or produced by him. The plaintiff has generated and will continue to generate electrical energy substantially in excess of that generated for barter, sale or exchange and the tax sought to be levied in the Act is, therefore, substantially different and greater than that expressed in the title.

3. The subject of the Act is not expressed in the Title [fol. 103] in that the Title provides that there shall be exempted from the tax "the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho", whereas the Act provides "that the full amount of such license tax which would have been due from the producer of electricity" shall be so exempt. These quantities are entirely different in that the energy "actually used" is substantially less than the energy taxable at the "place of production".

4. The title of the Act is deceptive in that the subject matter of the Act is not expressed in the Title.

B

The Act, in exempting from the Tax the electricity and electrical energy "used for pumping water for irrigation purposes to be used on lands in the State of Idaho" and

providing that a sum equal to the tax that would otherwise be paid by the producer shall be paid to the consumer, constitutes the levying of a tax for other than a public purpose, to wit: a tax for the benefit of an individual and furthermore imposes a tax for the benefit of municipal corporations, to wit: irrigation districts which pump water by means of electricity supplied by the plaintiff for irrigation purposes.

C

The said tax is a license tax and constitutes a second license tax imposed in the same year for the same purpose in that the plaintiff has heretofore been required to pay a license tax as provided by statutes of the State of Idaho heretofore enacted by said State, the payment of which tax is conditioned upon plaintiff's right to do business in the State as a corporation.

D

The tax imposed, or attempted to be imposed by said Tax Act, is a license tax.

[fol. 104]

E

The Extraordinary Session of the Legislature of the State of Idaho, at which said Act was passed, convened pursuant to a call made prior to the adjournment of the regular session of the Legislature and for the purpose of considering matters that had theretofore been considered at the regular session of said Legislature; that said regular session had made all appropriations necessary for the ensuing biennium and had levied a general ad valorem tax sufficient to meet all expenses of the Government of said State for said biennium. No extraordinary occasion existed justifying the calling of the Extraordinary Session of the Legislature of said State.

XXVI

The said Tax Act is uncertain and ambiguous in the particulars alleged in Paragraph 16 of the Bill of Complaint, and particularly:

(a) It cannot be determined from said Act whether a tax is to be levied on all kilowatt hours generated or produced

within the State of Idaho, including those used in the taxpayer's own operations or on such kilowatt hours as are generated or produced in the State of Idaho for barter, sale or exchange.

(b) Section 2 of said Tax Act provides that "taxes not paid on the due date shall become delinquent and shall bear interest from said due date at the rate of ten per cent per annum", while Section 8 of said Tax Act provides that any producer "who shall fail to pay the license tax herein provided for, or any part thereof, when due, shall be liable for three times the amount of the unpaid or delinquent tax".

[fol. 105] (c) Section 5 of said Act provides that the "full amount of such license tax which would have been due from such producers of electricity or electrical energy, if such exemptions (irrigation pumping)) had not been made, shall be credited annually for the year in which the exceptions are made on the power bill of the consumer by the producer of such electricity and electrical energy furnishing such power"; that the electrical energy supplied the irrigation consumer is not measured at the point of production where the Tax Act requires the same to be measured, but is measured at the point of consumption; that the measurements at the two places are entirely different and there is no method provided in said Tax Act for computing the exemption upon the amount of electricity measured at the points of use and no provision is made for determining the relation between the points of use and production. An enforcement of said Tax Act by the defendants will depend upon an arbitrary construction thereof.

XXVII

The Court further finds that the Tax Act is levied upon the producer of electrical energy measured by that energy produced for barter, sale or exchange exclusive of energy used by the plaintiff for its various uses, including station uses, and also exclusive of transmission or line uses. The measure of said tax is that energy actually sold and delivered to the customer or consumer for compensation.

XXVIII

The defendants, Commissioner and Attorney General, propose and have threatened to enforce, and will endeavor

to enforce, through appropriate action, the fines and penalties prescribed in said Tax Act; that such would result [fol. 106] in a multiplicity of suits in that a suit might be instituted for the collection of taxes and penalties each month that plaintiff failed to pay the tax; that the penalties are so unreasonable, burdensome and excessive that plaintiff could not safely refuse to pay the tax as the same is demanded; that there is no provision of the statutes of Idaho under which plaintiff could pay the tax under protest and recover back the amount so paid, but any payment so made would be credited to the general fund of the State and its reimbursement could not be effected except through a subsequent Act of the Legislature.

From the foregoing facts plaintiff moves the Court to make the following

Conclusions of Law

I

That the plaintiff is entitled to maintain this suit for injunctive relief to test the validity of said Tax Act.

II

That said Tax Act violates the Fourteenth Amendment of the Constitution of the United States in that Section 5 of said Act compels the appropriation and payment of money by the plaintiff for the sole and exclusive benefit of private individuals without compensation to the plaintiff therefor.

III

That said Section 5 cannot be eliminated from said Tax Act without destroying the entire Act.

IV

That said Tax Act violates Article III, Section 16, of the Constitution of the State of Idaho, which provides that every Act shall embrace but one subject and matters [fol. 107] properly connected therewith, which subject shall be expressed in the title in that:

(a) Both title and act contain two subjects, viz., (1) levying a tax for revenue purposes and (2) the application

of credits on the electric bills of certain consumers of electricity.

(b) The subject of the Act is not expressed in the title in that the title purports to levy a tax on electricity generated for barter, sale or exchange, whereas, the Act purports to levy the tax upon the producer of electricity for barter, sale or exchange on all electricity generated by such producer.

(c) The subject of the Act is not expressed in the title in that the title exempts from the tax electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho, whereas, the Act provides that the full amount of such tax which would have been due from the producer shall be exempt.

V

That said Tax Act, in exempting therefrom the tax on electrical energy "used for pumping water for irrigation purposes to be used on land in the State of Idaho" and providing that a sum equal to the tax that would otherwise be paid by the producer shall be paid to the consumer, is void because it violates the following provisions of the Constitution of the State of Idaho, to-wit:

(a) Section 13 of Article I of said Constitution which provides that no person shall be deprived of property without due process of law.

(b) It constitutes the levying of a tax for other than a public purpose, to wit: for the benefit of an individual in violation of Article VIII, Section 2, and Article VII, Section 2, of said Constitution.

(c) It imposes a tax for the benefit of municipal corpo- [fol. 108] rations, to wit: irrigation districts which pump water by means of electricity supplied by the plaintiff for irrigation purposes, in violation of Article VII, Section 6, of said Constitution, which provides that the legislature shall not impose taxes for the purposes of municipal corporations.

VI

That said Tax Act constitutes a violation of Section 2 of Article VII of the Constitution of the State of Idaho, in

that it imposes a double license tax and fails to provide for the levying of the tax according to valuation; the tax violates Section 5 of Article VII of the Constitution of the State of Idaho in that it fails to levy a uniform tax on same class of subjects within the territorial limits of said State.

VII

That said Tax Act violates the provisions of Section 9 of Article IV of the Constitution of the State of Idaho in that at the time the Extraordinary Session of the Legislature was called no extraordinary occasion existed for calling said session.

VIII

That said Tax Act is further void for the uncertainties and ambiguities recited in these Findings, which cannot be harmonized and construed together.

IX

That said Tax Act violates Clause 3, Section 8, Article I, of the Constitution of the United States, in that it imposes a direct burden upon the interstate commerce conducted and engaged in by the plaintiff in the generation, transmission, sale and use of electrical energy.

[fol. 109]

X

That it is impossible to segregate the tax attempted to be imposed by said Tax Act and measured by the intrastate business done by the plaintiff from that measured by the interstate business done by said plaintiff; that said Tax Act, in attempting to impose a tax upon interstate business, is void as to such business, and, because of its inseparability from intrastate business, is void in its entirety as the same applies to this plaintiff.

XI

That the plaintiff is entitled to a decree declaring said Tax Act unconstitutional and void, and for a permanent injunction perpetually restraining the defendants from enforcing the same.

Respectfully submitted.

Hawley & Worthwine, Merrill & Merrill, John F. MacLane, Geo. R. Corey, Solicitors for Plaintiff.

[fol. 110] IN UNITED STATES DISTRICT COURT

ORDER DENYING MOTION OF PLAINTIFF FOR FINDINGS OF FACT AND CONCLUSIONS OF LAW—Filed Feb. 13, 1932

Plaintiff's Motion to make and enter the foregoing Findings numbered 1 to 28 and the foregoing Conclusions of Law is hereby denied.

Dated this 30th day of January, 1932.

W. H. Sawtelle, J. Stanley Webster, Charles C. Cavanah, Judges.

[File endorsement omitted.]

[fol. 111] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

EXCEPTIONS OF PLAINTIFF TO REFUSAL OF COURT TO MAKE AND ENTER FINDINGS OF FACT AND CONCLUSIONS OF LAW PROPOSED BY PLAINTIFF AND EXCEPTIONS TO FINDINGS AND CONCLUSIONS MADE AND ENTERED AND DECREE THEREON—Filed Feb. 8, 1932

Comes now the plaintiff and excepts to the ruling of the Court denying plaintiff's Motion to make and enter those certain Findings of Fact Numbered I to XXVIII, inclusive, and to the Court's refusal to make Conclusions of Law Numbered I to XI, inclusive, which Findings of Fact and Conclusions of Law are set out specifically and in detail in the motion of plaintiff to make and enter findings of fact and conclusions of law filed in the above entitled cause on the — day of January, 1932. Plaintiff further excepts to Findings of Fact Numbered I to VI, inclusive, and to Conclusions of Law Numbered I to XII, inclusive, made, signed and entered in the above entitled cause, and to the Decree entered herein and thereon dissolving the Interlocutory Injunction heretofore granted the plaintiff and ordering the payment of the tax required by the Tax Act described in the Bill of Complaint. These exceptions are [fols. 112-122] taken generally and separately to the re-

fusal of the Court to make the Findings and Conclusions tendered by the plaintiff and to those made and entered by the Court upon the grounds that the law affecting and controlling the matters alleged in the plaintiff's Bill of Complaint and the issues made in this cause, and the evidence introduced in this action, and particularly such evidence touching the process of the generation, transmission and use of electrical energy upon the plaintiff's system and the manner and method of the plaintiff's operations in the generation, transmission and sale of electrical energy in and between the States of Idaho, Utah and Wyoming, require the Findings of Fact and Conclusions of Law proposed by the plaintiff and do not support the Findings of Fact and Conclusions of Law and Decree signed and entered by the Court.

Without waiving the foregoing general Exceptions, but expressly relying thereon, the plaintiff takes the following special and particular Exceptions to the refusal of the Court to make and enter:

* * * * * * *

[fol. 123]

XXV

Plaintiff excepts to Finding No. II to the effect that "it is a matter of speculation as to where markets will exist in the future for the electrical energy generated by the plaintiff at its said Idaho stations".

XXVI

Plaintiff excepts to Finding No. V to the effect that "electrical energy so generated is energy with new and different physical characteristics and new and different uses than energy in other forms"; and that the "electrical energy so produced is in the process of generation given definite characteristics with reference to voltage, frequency and its character as direct or alternating current as desired [fol. 124] and as required by the needs of the customers or the character of the system" and that "these characteristics are variable according to the character of the machinery employed"; that "the process of conversion of energy in the electrical form is completed at the generator

and before the pulses of energy leave the generator in their flow to the station bus or transformer"; and that "the amount of electrical energy so generated and measured is substantially greater than the amount which plaintiff may deliver to Utah or any distant point by reason of losses occurring in the subsequent process of transforming the flow of energy to a different current and voltage in order to transmission, and in or from the transmission line"; that "the kilowatt-hour is a unit of measurement of a definite physical entity, and of a commercial commodity produced by the plaintiff for transmission, delivery and sale to its customers and/or purchased by the plaintiff from other producers for such transmission, delivery and sale by the plaintiff"; and that "it is not the measurement of a period of time nor of service."

Plaintiff further specifically excepts to that portion of Finding No. V. to the effect that "the transformers are interposed to produce a different current and higher voltage" and that "such changes in the physical characteristics of the flow of energy from the generator and the production of a separate current are required in order to and in preparation for transmission and that the same are sub- [fol. 125] stantial in character; in that electrical devices or appliances designed to function with the current and voltage at which plaintiff generates would not function with the current and voltage at which the energy flows from the transformer"; and "similarly, the current and voltage transmitted is not in most instances delivered to the consumer but by the interposition of other transformers and separate current of lower voltage than that transmitted (and of lower voltage than that produced at the generator) is induced in the transformer coils connected to the distribution lines and delivered to consumers"; and that "such process is necessary in order to the utilization of those devices and appliances used by consumers of electrical energy".

Plaintiff further specifically excepts to that portion of Finding No. V. to the effect that "the Court finds that it is not true that the system of the plaintiff is purely a transferring device; but that the primary and essential function of the generator is to convert energy from the mechanical into the electrical form and to produce an electrical cur-

rent, and that the primary and essential function of the transformer is to prepare the energy flow for transmission through the induction of a new and separate current of higher voltage which may be economically transmitted"; and that "the consumer receives and must receive both current and power; and that the measurement of electrical power generated or delivered to the consumer is the product of current and voltage. The original source of both electric power and electric current is in the generator.

[fol. 126] XXVII

Plaintiff excepts to Finding No. VI. to the effect that "as to each of such stations (stations in Idaho) a use of water is had and enjoyed by plaintiff under permit and license of the State of Idaho"; and that "the electrical energy so obtained by utilization of such power of falling water is in all respects identical with the electrical energy obtained through the utilization of power of burning fuel".

With respect to the Conclusions of Law requested by the plaintiff and those made by the Court, the plaintiff generally and specifically excepts to each Conclusion of Law made by the Court to the effect that the said Tax Act does not violate the various provisions of the Constitution of the United States and the Constitution of the State of Idaho specifically recited in said Conclusions and in not concluding that said Tax Act does violate each and every constitutional provision recited and referred to in plaintiff's Bill of Complaint.

Respectfully submitted.

John F. MacLane, Geo. R. Corey, Hawley & Worthwine, Merrill & Merrill, Solicitors for the Plaintiff.

[fol. 127] In United States District Court

[Title omitted]

Order Allowing Exceptions—Filed Feb. 15, 1932

The exceptions of plaintiff to refusal of Court to make and enter findings of fact and conclusions of law proposed by plaintiff and exceptions to findings and conclu-

sions made and entered and decree thereon having been duly presented to the Court herein:

Now, therefore, upon consideration, it is hereby ordered that said Exceptions generally and separately are each and all allowed.

Dated this 7th day of February, 1932.

Wm. H. Sawtelle, J. Stanley Webster, Charles C. Cavanah, Judges.

[File endorsement omitted.]

[fol. 128] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT FOR THE DISTRICT OF IDAHO, SOUTHERN DIVISION

In Equity. No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff,

vs.

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, Defendants

FINDINGS OF FACT AND CONCLUSIONS OF LAW—Filed Feb. 15, 1932

This cause came on regularly for hearing before the Hon. William H. Sawtelle, Circuit Judge, and J. Stanley Webster and Charles C. Cavanah, District Judges, sitting as a statutory three-judge court, on the 2nd day of July, 1931, upon the application of the plaintiff herein for an interlocutory injunction, and the cause having been argued and submitted to the Court and the Court having filed its Memorandum Opinion denying the contentions of the plaintiff in all respects save and except as to the allegations in said complaint that the act in question contravened the provisions of Article I, Section 8, Clause 3 of the Constitution of the United States, which question was thereafter to be [fol. 129] submitted upon the evidence to be taken, and an Order having been entered granting the said interlocutory

injunction, said cause came on for final hearing upon the issues framed by the Bill of Complaint of the plaintiff and the amended answer of the defendants thereto.

Evidence was introduced by and on behalf of the respective parties before a Master, pursuant to an order of Court limiting the taking of testimony before said Master to the issue of fact relating to the Interstate Commerce clause of the Constitution, and said Master having made his report and filed said testimony in said Court and further briefs having been filed by the parties, the Court, pursuant to Equity Rule No. 70½ of the Supreme Court of the United States, makes the following Findings of Fact, to-wit:

I

The first seven paragraphs of the Bill of Complaint are admitted to be true by the amended answer of the defendants, save and except it is denied by the defendants that the plaintiff is or has been engaged in generating electrical energy in interstate commerce between states, or that electrical energy may be generated in interstate commerce; and denied that the defendant Commissioner will construe the Tax Act, hereinafter referred to, to apply to all electricity produced by the plaintiff, but only to such as is pro-
[fol. 130] duced for barter, sale or exchange. With respect to the disputed allegations in said paragraphs the Court finds that the defendants are charged with the duty of enforcing the provisions of that certain Tax Act passed by the Legislature of the State of Idaho in Extraordinary Session March 17, 1931, by the terms of which a tax of one-half mill per kilowatt hour is imposed upon the producer of electricity generated or produced within the State of Idaho for barter, sale or exchange. The defendants have prescribed forms and have notified the plaintiff that it must pay such tax as provided for in said Act without regard to whether or not said electrical energy is consumed within or without the State of Idaho and irrespective of transmission losses, but not including such electrical energy as is used by the plaintiff in station uses. Defendants will attempt to collect only such penalties of plaintiff as accrue under the provisions of this Act, subject to the decree of this Court, for failure to pay a tax on electricity generated for barter, sale and exchange.

II

The plaintiff owns and operates an electric power system consisting of generating stations, transmission and distribution lines, and other electrical equipment located in the States of Idaho, Utah and Wyoming, so interconnected as to enable plaintiff to deliver electrical energy to any place [fol. 131] on their transmission and distribution lines from any generating station connected to their system. Energy in the electrical form is generated by plaintiff and transmitted, distributed and delivered in barter, sale and exchange to its customers in each of said states. As part of said system, plaintiff owns and operates several hydro-electric stations located in the State of Idaho; consisting of certain stations on the Bear River known as Soda, Grace, Cove and Oneida, and stations at Ashton, St. Anthony, Idaho Falls, Shelley, Paris, High Creek and Georgetown.

During the year 1930 there was generated or produced in or by those generating stations of plaintiff located in Idaho, electricity measured through integrating watt hour recording meters in terms of 233,253,000 kilowatt hours, of which 199,968,000 kilowatt hours were generated at its Bear River stations in Idaho, and 33,285,000 kilowatt hours were generated at its other Idaho stations. Of the kilowatt hours so generated, 6,978,000 kilowatt hours were used for station uses at Idaho stations, 24,046,000 kilowatt hours were delivered to its Idaho consumers or used at its division offices, 198,502,000 kilowatt hours were for transmission to Utah and the remainder consumed by transmission and other losses.

The Soda, Grace, Cove and Oneida stations have a combined capacity of 95,500 kilowatts and deliver most of their output to three 130,000 volt transmission lines extending directly from said stations through Idaho to a station named "Wheelon" in Utah and thence to a receiving and [fol. 132] switching station named "Terminal" near Salt Lake City, Utah.

There is no delivery of electricity from said 130,000 volt lines in Idaho, the first use therefrom being at Wheelon, Utah, and the principal use of said electricity being at Points to which it is delivered in Utah and Wyoming after the same has passed through said Terminal Station. The

measured output of the Bear River stations in Idaho to the 130,000 volt transmission lines was 161,649,000 kilowatt hours.

The local customer deliveries in Idaho from the Idaho stations last above mentioned are from separate outgoing lines segregated at the generating bus. Approximately two per cent. of the energy generated at said stations is delivered to local customers in Idaho. In addition to electricity transmitted over said 130,000 volt lines, some electricity from said stations is also delivered to Utah over 44,000 volt lines from the Grace station.

The operations described for the year 1930 are similar to and descriptive of plaintiff's operations as the same are now practiced during 1931; that it is a matter of speculation as to where markets will exist in the future for the electrical energy generated by plaintiff at its said Idaho stations.

[fol. 133]

III

Upon the above described property, and in connection with its business aforesaid, plaintiff has been and will continue to be required to pay annually, taxes imposed under the general tax laws of Idaho, as follows:

(a) A general property tax levied annually upon all property, real and personal, of the plaintiff, situated within the State of Idaho, in proportion to its value, in common with all other property in the State not exempt from taxation. Plaintiff has paid such general property tax upon its property in Idaho annually; this tax for the year 1930 amounted to $412,090.07 and was based upon an assessed valuation of $11,088,009.00; and a like assessment will be made and a like tax levied and paid for the calendar year 1931, and in subsequent years.

(b) An annual license or corporation franchise tax for the right to exist and do business in Idaho as a corporation, based upon plaintiff's authorized capital stock, which tax plaintiff has paid annually since its incorporation and qualification to do business in Idaho.

(c) An income tax, effective July 1, 1931, levied and collected upon the net income of plaintiff in Idaho.

[fol. 134] IV

Under said Tax Act and in accordance with the interpretation placed thereon by the Commissioner, plaintiff would have paid for the year 1930, has said Tax Act been then effective, an amount in excess of $100,000.00. The gross business of the plaintiff in Idaho for the year 1930, from the production and sale of electricity within said state, amounted to approximately $735,000.00.

V

The terms "generation", "manufacture", and "production", as applied to energy in the electrical form are synonymous designations applied to the essential process of converting or transforming energy taken from some source in nature, (i. e., the power in falling water or the power of burning fuel) into energy in the electrical form in order to its use in electrical appliances and devices. The electrical energy so generated is an energy with new and different physical characteristics and new and different uses than energy in other forms, and may be transported and delivered with greater economy and facility. In particular, and as related to plaintiff's system, such electrical energy is adapted to and employed in the operation or use of various devices and appliances by plaintiff's customers which will not function with other than electrical energy, or will not function with like convenience, facility or con-
[fol. 135] trol, or is sold to others who wish electrical energy for distribution and sale.

Such generation is accomplished by means of certain mechanical devices designed, constructed, and employed by man for such purpose, and the electrical energy so produced is in the process of generation given certain definite characteristics with reference to voltage, frequency and its character as director or alternating current as desired and as required by the needs of customers or the character of the system. These characteristics are variable according to the character of the machinery employed.

The process of conversion to energy in the electrical form is completed at the generator and before the pulses of energy leave the generator in their flow to the station bus or transformer. The amount of energy so converted is capable of exact measurement at such point, and is com-

monly measured there by plaintiff. And the amount of electrical energy so generated and measured is substantially greater than the amount which plaintiff may deliver to Utah or any distant point by reason of losses occurring in the subsequent process of transforming the flow of energy to a different current and voltage in order to transmission, and in or from the transmission line.

[fol. 136] Electricity in motion constitutes an electrical current. The fundamental unit of measurement of electric power is the watt, which is the product of the electrical current and the voltage or pressure. Power manifesting itself through the instrumentality of electric current and voltage is known as electric power, and electrical energy is electrical power generated over a period of time. The kilowatt hour is a unit of measurement of the amount of electrical energy equal to generation at the rate of one kilowatt (or thousand watts) for one hour. The Court finds that the kilowatt hour is the unit of measurement commonly employed in the electrical industry, with regard either to amounts generated, transmitted, sold or delivered, of a quantity of electrical energy that will accomplish a certain, definite amount of mechanical work, and which may be generated and/or delivered or used within the period of less than a second or over the course of hours. That the kilowatt hour is a unit of measurement of a definite physical entity, and of a commercial commodity produced by plaintiff for transmission, delivery and sale to its customers, and/or purchased by plaintiff from other producers for such transmission, delivery and sale by plaintiff. It is not a measurement of a period of time nor of service. Plaintiff delivers energy to its consumers or purchasers only in the electrical form, and measures amounts delivered only in such form.

[fol. 137] In the operation of plaintiff's system, electrical energy passes from the generator to a transformer immediately adjacent to the generating station. Because the electrical energy produced by plaintiff cannot be transmitted to Terminal station as the same electrical current and with the same voltage at which generated without a loss in transmission, in the consumption by or loss of energy from the transmission line, of substantially the greater part of the electrical energy generated, the transformers are in-

terposed to produce a different current and higher voltage which may be transmitted without a similar loss or consumption. Plaintiff generates at 2300 or 6600 volts and transmits at 130,000 volts. With the separate current so induced and such higher voltage, plaintiff transmits electrical energy to Terminal station with substantially less loss from or consumption by the transmission line.

Such changes in the physical characteristics of the flow of energy from the generator and the production of a separate current are required in order to and in preparation for transmission, and the same are substantial in character; in that electrical devices or appliances designed to function with the current and voltage at which plaintiff generates would not function with the current and voltage at which the energy flows from such transformer.

Similarly, the current and voltage transmitted is not in most instances delivered to the consumer, but by the inter- [fol. 138] position of other transformers a separate current of lower voltage than that transmitted (and of lower voltage than that produced at the generator) is induced in the transformer coils connected to the distribution lines and delivered to consumers. And such process is necessary in order to the utilization of those devices and appliances used by consumers of electrical energy.

The Court finds that it is not true that the entire system of plaintiff is purely a transferring device; but that the primary and essential function of the generator is to convert energy from the mechanical into the electrical form and to produce an electrical current, and that the primary and essential function of the transformer is to prepare the energy flow for transmission through the induction of a new and separate current of higher voltage which may be economically transmitted. The functioning of the transformer is with respect to any electrical energy generated by plaintiff subsequent to its production and to the measurement of amounts generated.

The Court finds that the flow of power or energy from its natural source is, during the operation of plaintiff's system and use by consumers, continuous from the falling water to the consumers' devices and at the speed of approximately 186,000 miles per second; and that it is power or energy [fol. 139] which is consumed by such device; but that the

consumer receives and must receive both current and power; and that the measurement of electrical power generated, or delivered to the consumer, is the product of current and voltage. The original source of both electric power and electric current is in the generator.

VI

The electrical energy demanded by plaintiff's customers is supplied by such station or stations, whether in Idaho or in Utah, as designated by plaintiff's dispatcher at Terminal station, under whose directions different stations may be selected to meet the demand then being made for electrical energy, or the demand apportioned between different stations in varying amount, or such demand or a part thereof made upon the stations of the Idaho Power Company from whom plaintiff purchases electrical energy. In addition to the amounts of electrical energy generated by plaintiff's stations in Idaho the plaintiff also purchases substantial amounts of electrical energy from the Idaho Power Company, which is sold and delivered to plaintiff in measured amounts in Idaho for delivery by plaintiff to customers in Utah in satisfaction of their, or a part of the above mentioned, demands.

Plaintiff's generating stations in Idaho are located in such points as enable it to use the power in falling water [fol. 140] from the streams and watersheds of Idaho, in lieu of power obtained from burning fuel. As to each of such stations, a use of water is had and enjoyed by plaintiff under permit and license of the State of Idaho. The electrical energy so obtained by utilization of such power of falling water is in all respects identical with the electrical energy obtained through the utilization of power of burning fuel, and in practical operations the producer's choice between such sources of power is one dictated by economic factors.

The character of electric energy as generated at said Idaho stations of plaintiff is such that the same may be delivered and sold in barter, sale or exchange, and used, at or in the vicinity of the plant, or at or to any other places in Idaho within a radius of two hundred miles or more, where customers and uses and markets may be found or developed therefor, or to demands from industries or

uses which may hereafter be developed in such territory. Said generating stations of plaintiff other than those referred to as the Bear River Stations are commonly operated primarily for the supply of markets local to the station; but the Court finds that the functioning of the generator and generating station is essentially the same without regard to the place from which its energy output is demanded and to which it is delivered by the transmission network, operating under control of the dispatcher.

[fol. 141] Similarly, the percentage of the output of any station which is delivered by the transmission and distribution lines to consumers is dependent upon the character of construction and efficiency of maintenance of the transmission and distribution lines, and the equipment used in connection with such lines, not upon any characteristic of the generator.

The Court further finds that the amount of electrical energy delivered to or passing any point upon plaintiff's transmission or distribution lines, or the losses between any two points, may be exactly and definitely measured and ascertained, and that in common practice this is done as a commercial operation.

[fol. 142] From the foregoing Facts, the Court makes the following

Conclusions of Law

I

That said Tax Act does not violate the Fourteenth Amendment of the Constitution of the United States in that it does not deny the plaintiff, engaged in the business of generating or producing electricity and electrical energy in the State of Idaho, equal protection of the laws and does not render its property liable to be taken without due process of law.

II

That said Tax Act does not violate the Fourteenth Amendment in that Section 5 does not compel the appropriation and payment of money for the benefit of private individuals.

III

That said Tax Act does not violate Article III, Section 16 of the Constitution of the State of Idaho, which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title in that the provisions of said Act are in each necessary particular expressed in the title, and said Act embraces but one subject.

[fol. 143]

IV

That said Tax Act does not violate Section 13 of Article I of the Constitution of the State of Idaho in that the plaintiff is not deprived of its property without due process of law.

V

That said Tax Act does not violate Section 2 of Article VIII and Section 2 of Article VII of the Constitution of the State of Idaho, in that said Tax Act does not constitute the levying of a tax for other than a public purpose nor constitute the levying of a tax for the benefit of an individual.

VI

That said Tax Act does not violate Section 6 of Article VII of the Constitution of the State of Idaho in that it does not impose a tax for the benefit of a municipal corporation, to-wit: an irrigation district.

VII

That said Tax Act does not constitute a violation of Section 2 of Article VII of the Constitution of the State of Idaho and that it does not impose a double license tax for the same purpose, in that said Tax Act imposes an excise tax upon the producer of electrical energy for barter, sale, or exchange; whereas the license tax imposed upon plain-
[fol. 144] tiff is a corporate franchise tax for the privilege of existing and doing business in the state as a corporate entity.

VIII

That said Tax Act does not violate Section 2 of Article VII of the Constitution of the State of Idaho in failing to provide for the levying of the tax according to valuation,

nor Section 5 of Article VII in that it does not provide for the levying of a uniform tax upon the same class of subjects within the territorial limits of the authority levying the tax, nor constitute double taxation, in that said tax is not a property tax but an encise tax.

IX

That said Tax Act does not violate the provision of Section 9 of Article IV of the Constitution of the State of Idaho, in that the determination of the Governor as to whether or not an extraordinary session exists for the calling of a special session of the legislature is conclusive upon the courts.

X

That said Tax Act is not void for uncertainties and ambiguities.

[fol. 145]

XI

That said Tax Act does not violate Clause 3, Section 8, Article I of the Constitution of the United States, in that it does not impose a burden upon any act of interstate commerce. That the generation of electrical energy by plaintiff's generation stations is an act of intrastate commerce.

XII

That defendants are entitled to a decree dissolving the interlocutory injunction heretofore issued in said cause, and requiring the plaintiff to pay the accumulated tax with interest and costs, but without penalties during the pendency of this action.

Let the Decree be entered accordingly.
Dated this 30 day of January, 1932.
Wm. H. Sawtelle, J. Stanley Webster, Charles C. Cavanah, Judges.

[fol. 146] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT FOR THE DISTRICT OF IDAHO, SOUTERN DIVISION

In Equity. No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff,

vs.

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, Defendants

DECREE—Filed Feb. 15, 1932

This cause came on to be further heard at this term on the merits and was submitted by counsel and thereupon, upon consideration thereof, it was ordered, adjudged and decreed as follows, viz:

That the Interlocutory Injunction heretofore granted in this cause be dissolved, and that the tax required by the Act here in question, more specifically referred to in Paragraph IV of Plaintiff's Bill of Complaint, with interest thereon as therein provided, but without any penalties as provided for in said Act which may have accrued during the pendency of this action, be paid by the plaintiff to the State of Idaho;

That defendants recover from plaintiff their costs herein and tax in the sum of $244.99.

[fols. 147-149] Dated February 8, 1932.

Wm. H. Sawtelle, J. Stanley Webster, Charles C. Cavanah, Judges.

[fol. 150] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT IN AND FOR THE DISTRICT OF IDAHO, SOUTHERN DIVISION

No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff,

against

EMMITT PROST, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, Defendants

Statement of Evidence—Filed Feb. 15, 1932

This cause was brought to enjoin the enforcement as against the plaintiff, of an act of the Legislature of Idaho passed at the Extraordinary 1931 Session thereof, levying a tax of one-half mill per kilowatt hour with respect to electric energy "generated, manufactured or produced" within the State of Idaho for "barter, sale or exchange." A copy of the act is attached to plaintiff's Bill of Complaint as Exhibit A.

The grounds on which injunction was sought are fully stated in the Bill and involve questions of both State and Federal constitutional law intrinsic in the act, and the extrinsic ground that, as applied to the plaintiff, the act imposes a burden on interstate commerce in electric energy between Idaho, Utah and Wyoming.

On plaintiff's application for interlocutory injunction, a Special Statutory Court, consisting of Sawtelle, Circuit Judge, Webster and Cavanah, District Judges was convened at Boise, Idaho on the 2nd day of July, 1931; an order restraining the enforcement of the tax pending decision on the application was granted and on the 20th day of August, 1931, a decision was filed by said Court (memorandum opinion by Judge Cavanah) in which the act was sustained against all objections of the plaintiff intrinsic to the act, but reserving for hearing on the merits, the question [fol. 151] of whether, as applied to the plaintiff, the act imposes a burden on interstate commerce, and an interlocu-

tory injunction was granted. L. O. Hamilton was appointed by the Court as Master to take testimony on this question and report to the Court, without findings.

The cause came on for final hearing before said Special Master at Seattle, Washington, pursuant to agreement of the parties, on September 30, 1931, the plaintiff appearing by John F. MacLane, Esq., of New York City, and George R. Corey, Esq., of Salt Lake City, Utah, and the defendants appearing by Hon. Fred J. Babcock, Attorney General of the State of Idaho, and Hon. Sidman I. Barber, Assistant Attorney General of the State of Idaho.

The following proceedings were had:

STIPULATION RE ORIGINAL ANSWER

It was stipulated, in lieu of the plaintiff's offering in evidence the original answer of the defendants, as follows:

The original answer filed on or about September 2, 1931, contained in Paragraph XII thereof the following clause:

"Defendants admit that the generation, transmission and use of electric energy is in practical operation continuous and practically simultaneous, and that at the time of use of electrical energy by the consumer there is a continuous electrical and electro-magnetic path between the windings in the generator and the windings in the consumer's motor."

The amended answer filed on or about September 22, 1931, in Paragraph XII omits or modifies the language above quoted to read as follows:

"Defendants deny that the generation, transmission and use of electrical energy is continuous or simultaneous; admit that at the time of use of electrical energy by the consumer (except for the interposition and operation of transformers as hereafter set forth) there is a continuous electrical and electro-magnetic path."

The underscored words in the following quotation from [fol. 152] Paragraph XII are new to the amended answer, and were not in the original answer:

"and allege the fact to be that an additional amount of electrical energy is required to be and is generated in order

to permit *the production at the transformer,* and transmission and delivery of the energy required by the consumer to his devices *and that the electrical current produced at the generators is not the same current which is delivered to the consumer.*"

Also the following:

"*but allege that the electrical current produced at such stations is not transmitted to Terminal Station but is employed for the production of a new and different current in the transformer which is transmitted to the said Terminal Station.*"

Also immediately following the last quotation are the words:

"Defendants *deny* that power or electricity generated at various Utah stations is transmitted to Terminal Station," and in place thereof the original answer reads:

"Defendants admit that power or electricity generated at various Utah stations is transmitted to Terminal Station."

Also, the following language of the amended answer is entirely new thereto and is not contained in the original answer (beginning with the paragraph of Paragraph "12", on page 14, reading as follows):

"Such generation, manufacture or production is accomplished by the utilization of power obtained from burning fuel, or of natural or created sources of waterpower. The force of the water or steam pushing against the blades of the turbine wheel causes the turbine shaft to revolve and with it the rotating portion of the electric generator. As a result of the continuous motion of a system of electrical conductors across a magnetic field which is maintained in the generator by separate excitation of its field coils, electrical energy is made available at the stator or stationary [fol. 153] part of the generator and consuming devices or appliances may be connected by wires thereto and the energy so generated used at such place." * * *

(continuing through the paragraph, on page 16 of said paragraph "12", reading as follows:)

"Similarly, the current transmitted is not in most instances the current delivered to the consumer, but by the interposition of other transformers a current of lower voltage than that transmitted (and of lower voltage than that produced at the generator) is induced in the transformer coils connected to the distribution lines and delivered to consumers."

In response to a question of Mr. Barber as to the purpose of this excerpt Mr. Maclane stated:

"Primarily to show that the interjection of the detailed questions of the operation of transformers occurred subsequently to the taking of our depositions in the East, and to explain the reason why we didn't go into the technical discussion of the nature of electric current and electricity, and of voltage, with Dr. Millikan and Dr. Langmuir. I may also suggest from this record, that possibly the amendment in the answer was due in part to the decision of the Federal Court in Carolina on similar questions to those involved in this case."

* * * * * * *

Under objection by Mr. Barber on the ground that it is incompetent, irrelevant and immaterial, and, particularly, that it is not relevant to any issue in this case, under decision of the court on motion for temporary injunction, and by stipulation that subject to such objection and ruling of the court thereon, it is offered in lieu of the testimony of Fred Lukens, Secretary of State of Idaho, there was offered in evidence by the plaintiff the affidavit of said Fred Lukens containing certified copies of the transcript of the proceedings of the 1931 regular and extraordinary sessions of the Legislature of Idaho in respect to the introduction, consideration and passage of the Tax Act involved [fol. 154] in this case, said affidavit being received with the same effect as if Mr. Lukens were personally present and had testified as stated in such affidavit.

Affidavit of Fred E. Lukens

The affidavit condensed and reduced to narrative form is as follows:

My name is Fred E. Lukens, residence, Boise, Idaho. I am now and ever since the 5th day of January, 1931, have

been the duly elected, qualified and acting Secretary of the State of Idaho, and as such have under my control and in my possession all journals and records of the Twenty-first session of the Legislature of the State of Idaho and of the Extraordinary Session of the Twenty-first Legislature of the State of Idaho; that the regular session of said Legislature convened at Boise, Ada County, Idaho, on the 5th day of January, 1931, and adjourned sine die at nine o'clock p. m. on the 5th day of March, 1931; that the Extraordinary Session of the Twenty-first Legislature of the State of Idaho convened at Boise, Ada County, Idaho, at twelve o'clock noon on the 6th day of March, 1931, and adjourned at 5:30 o'clock p. m. on the 13th day of March, 1931.

That at the regular session of the Legislature there was introduced and duly and regularly passed and signed by the Governor House Bill No. 340, as follows:

"Levying an ad valorem tax for each of the fiscal years 1931 and 1932 to provide revenue to pay the necessary general expenses of the state of Idaho during the period beginning January 1, 1931, and ending December 31, 1932, and other general expenditures of the state, and declaring an emergency

"Be it enacted by the Legislature of the State of Idaho:

"Section 1. That there is hereby levied an annual ad valorem tax of Two Million Two Hundred and Fifty Thousand Dollars ($2,250,000.00) for each of the fiscal years 1931 and 1932, upon all the property in the State of Idaho not legally exempt from taxation for the purpose of providing revenue to pay the necessary general expenses of the state during the period beginning on the first day of January, 1931, and ending on the 31st day of December, 1932, and other general expenditures of the State.

[fol. 155] "Section 2. An emergency existing therefor, which emergency is hereby declared to exist, this act shall be in force and effect from and after its passage and approval."

That said Act, last above recited, is a law in full force and effect in the State of Idaho.

That during the regular session of the Twenty-first Session of said Legislature, to-wit: on the 29th day of January, 1931, there was introduced in the House of Representatives House Bill No. 44, which said Bill was amended in several instances and as amended is substantially identical with House Bill No. 3, passed by the Extraordinary Session of the State of Idaho, except it did not contain Section 5 which appears in House Bill #3; that House Bill No. 44 was considered by the Committee of the House on Revenue and Taxation and pursued its regular course on the calendar and reached third reading. Thereupon motion prevailed that House Bill 44 retain its place on the calendar for consideration Thursday, March 5, 1931. On Thursday, March 5, 1931, House Bill 44 was, with unanimous consent, withdrawn.

On March 5, 1931, there was offered and read in regular session of the House and also of the Senate a communication from the Governor in the following language:

"Proclamation.

"Whereas, the failure of the regular session of the Legislature to enact tax laws, to meet the pressing demands of the State requires the convening of a special session of the State Legislature;

"Now, therefore, I, C. Ben Ross, Governor of the State of Idaho, by virtue of authority in me vested, by this Proclamation call the Legislature of the State of Idaho to meet in special session at the Capitol at Boise City, in Ada County, Idaho, on the 6th day of March, 1931, at 12 o'clock M. for the following purposes and none other, to-wit:

"For the purpose of considering and enacting laws, imposing taxes for raising of the needful public revenues, considering and determining the form and scope of such taxation, the manner of levying the same, and the subjects of such taxation and each and every matter necessary to a full consideration and enactment of such laws, and any and all matters affecting the public revenues and the levying and collecting of taxes for public purposes, and to consider and propose amendments to the revenue provisions of the Constitution of the State of Idaho;

[fol. 156] "The Legislature may also provide for the expenses of the session, and other matters incidental thereto.

"In witness whereof I have hereunto set my hand and caused the seal of the State of Idaho to be affixed by the Secretary of State, this 5th day of March, 1931.

(Signed) C. Ben Ross, Governor."

That said Proclamation was filed in my office on March 5, 1931, at 4 P. M. of said day.

That at noon on March 6, 1931, said Legislature met, pursuant to the Proclamation, in special session and heard read the foregoing Proclamation and also received from the Governor the following message:

"Message from the Governor

"Members of the Legislature of the State of Idaho, convened in extraordinary session March 6, 1931:

"You have been called in extraordinary session after a long and arduous siege dealing with legislative matters during the last sixty days to complete what, in my opinion, is the most important part of our legislative program, the thing that strikes at the very foundation of our government, taxation.

"While you are now free from all other legislative duties, your attention for the next few days can be devoted to this intricate question.

"Idaho is a young and growing State of less than 500,000 individuals, and since the necessary cost of carrying on our State Government is naturally nearly as burdensome as it would be if our population were much larger, it becomes imperative that every individual and corporation should carry his or its share of the burden of taxation. Interested taxpayers and citizens of Idaho have for the last six weeks been laboring on a tax measure which, it is believed, will go a great ways towards solving the present tax problem of the State of Idaho. The result of the labor and consideration given this question is generally embodied in what was termed House Bill No. 266, during the session of the legislature just ended. Numerous amendments have been proposed and discussions had concerning the provisions of this proposed bill. However, they have generally been of minor importance. The bill has been printed for some time, has been in the hands of the legislature and generally circulated throughout the State of Idaho, and the

taxpayers who are affected, thereby, are undoubtedly more familiar with the provisions of the same than with any other proposed legislation. This bill can and should be used as a basis for the necessary tax legislation.

"I have taken the liberty of calling this particular bill to your attention for the reason that the tax question is necessarily a complicated problem, the details of which [fol. 157] must be worked out by a small group of informed and interested persons for the consideration of a larger group, and it is to be hoped and you will give this particular bill your very serious consideration before an attempt is made to prepare another tax measure.

"You have heretofore had before you for your consideration the question of a tax upon electrical energy developed from the natural resources of the State of Idaho. While it is true that the interests developing this energy are paying taxes on the physical property used in the development of these natural resources, nevertheless it is my opinion that electrical energy generated from our natural resources should be required to bear at least a portion of the burden of taxation for the benefit of our people, and a small tax should be placed on this class of property, and inasmuch as the control of the development of electrical energy in the State of Idaho at the present time amounts to a monopoly, such a tax as suggested cannot be unreasonable.

"The Constitution of Idaho touching upon the matters of revenue should be broadened to such a degree as to give the legislative bodies a wider power and more authority in the matter of taxing the various kinds of property within the State of Idaho, and I respectfully call your attention to this matter so that a joint resolution may be introduced submitting to the people of Idaho the question of amending the constitution.

"Respectfully submitted.

"C. Ben Ross, Governor."

That at the Extraordinady Session of said Legislature there was introduced and passed House Bill No. 3, being "an Act levying a license tax of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange; and providing for the collection and distribution of such tax; and for forms and procedure to be used

and followed; requiring reports of the production of electricity and electrical energy and the furnishing of equipment for measuring same; prescribing penalties for violation of this act; exempting from such license tax the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho and providing that such exemptions shall accrue to the benefit of the consumer of such electricity and electrical energy; prescribing the duties of the State Commissioner of law enforcement under this act, requiring him to give a bond of [fol. 157½] the faithful performance of said duties and fixing the amount thereof, and making an appropriation with which to carry out its purposes," which said Act is further set out in full and at length as Exhibit "A", attached to the Bill of Complaint in this action and became Chapter 3 of the Laws of said Extraordinary Session of 1931.

That said Extraordinady Session adjourned March 13, 1931, and said Bill was signed by the Governor on March 17, 1931.

STIPULATION RE EXHIBIT "A"

It was stipulated that Exhibit A, attached to plaintiff's Bill of Complaint, is a true and correct copy of the Tax Act involved in the case, to be considered as plaintiff's Exhibit A without further identification.

* * * * * * * * *

Subject to objection as incompetent, irrelevant and immaterial, and not pertinent to the issues under the decision on motion for preliminary injunction, but waiving objection to the failure to produce the defendant Emmitt Pfost, Commissioner of Law Enforcement of Idaho, personally, or the Secretary of the Company, to whom the letter was addressed, for the purpose of identifying the exhibit, there was offered in evidence as plaintiff's Exhibit B, a certified copy of the letter directed by defendant Commissioner to the Secretary of plaintiff company, under date of June 30, 1931, having attached thereto a printed form of license tax statement required by Section 4 of the Tax Act and the so-called "Certificate of Producer" required by Section 3 of the Tax Act, which letter and statement are as follows:

[fol. 158] PLAINTIFF'S EXHIBIT "B"

U. S. District Court, District of Idaho. Filed Jul. 2, 1931.
W. D. McReynolds, Clerk, by —— ——, Deputy

IN THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF IDAHO, SOUTHERN DIVISION

In Equity. No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff,

against

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, Defendants

State of Idaho, Department of Law Enforcement

UNITED STATES OF AMERICA,
State of Idaho, ss:

I, Emmitt Pfost, the duly appointed, qualified and acting Commissioner of Law Enforcement of the State of Idaho, do hereby certify that the annexed forms entitled "License tax statement" and "Certificate of producer of electrical energy for barter, sale or exchange," are true and correct copies of the forms of statements which I have prescribed pursuant to the provisions of Chapter 3, Laws of the Extraordinary Session of the Twenty-first Legislature of the State of Idaho.

I do further certify that on June 30, 1931, I transmitted said forms to the Utah Power & Light Company, together with a letter, a true copy of which is attached hereto.

In testimony whereof I have hereunto set my hand and affixed the seal of my office this 1st day of July, 1931.

Emmitt Pfost, Commissioner Department of Law Enforcement, by Ines Yturri, Deputy. (Seal.)

[fol. 159]

June 30th, 1931.

Mr. Geo. B. Thomas, Secy. Utah Power & Light Company, Kearns Building, Salt Lake City, Utah.

DEAR SIR: Enclosed please find one copy of "Certificate of Producer of Electrical Energy for Barter, Sale, or Ex-

change", and six copies of Monthly "License Tax Statement", as provided for in Chapter 3, Laws of the Extraordinary Session of the Twenty First Legislature of the State of Idaho.

The Certificate of registration is to be filed in this Department once prior to the filing of the License Tax Statements which are filed each month. First payments of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale, or exchange, are due July 15, 1931.

Kindly file your Certificate of Registration as soon as possible with this Department for the current year, and file the monthly statements each month on the enclosed blanks.

Respectfully yours, (Signed) Emmitt Pfost, Commissioner Department of Law Enforcement.

[fol. 160] License Tax Statement to the Commissioner of Law Enforcement of Idaho of Electrical Energy Generated in Idaho for Barter, Sale, or Exchange, Calendar Month of ——, 193-.

1. Name of Producer: —— ——.

2. Total kilowatt hours electrical energy generated in State during month ..... —— KWH.

3. Total kilowatt hours (included in item 2) furnished for pumping water (not sold or rented) for irrigation purposes on lands within State of Idaho ..... ——

4. Total kilowatt hours (included in item 2) actually transformed into power or light by Producer for use personal to it, and not bartered, sold or exchanged; exclusive of losses in transmission ..... ——

—— —— KWH.

5. Net Taxable Generation (item 2 minus items 3 and 4) ..... —— KWH.

6. Tax due (½ mill per KWH. on net) ..... $——

7. Statement of annual credits made on power bills of consumers of electrical energy furnished for pumping water (not sold or rented) for irrigation purposes on lands within the State of Idaho, to the full amount of tax which would be due on such energy if not exempt. (Attach as Schedule A)

Total ..... $——

STATE OF ——,
County of ——, ss:

—— ——, being first duly sworn, on oath says that he is —— of ——; that as such officer he has supervision over the books, records and accounts of said Producer; that he knows that such books have been kept in good faith during the period covered by the foregoing statement and with respect to the matters therein set forth, show an accurate and full record of the facts hereinabove set forth; that he has examined the said statement, and to the best of his knowledge, information and belief the information given in said report is full, true and correct.

—— ——.

Subscribed and sworn to before me this —— day of ——, 193-. —— ——, Notary Public for ——, Residing at ——.

NOTE.—This statement must be filed with the Commissioner of Law Enforcement of Idaho on or before the 15th day of each month, beginning July 15, 193-, together with payment of the amount of license tax due.

[fol. 161] Certificate of Producer of Electrical Energy for Barter, Sale, or Exchange

To the Commissioner of Law Enforcement, State of Idaho:

The within named Producer, engaged in the generation, manufacture, or production of electricity and electrical energy in the State of Idaho, for barter, sale or exchange, in compliance with the provisions of Chapter 3, Laws of the Extraordinary Session of the Twenty-first Legislature of the State of Idaho, does hereby certify:

(a) That the name under which the producer is transacting business in the State of Idaho is: ——

(b) Post Office address and principal place of business within the State: ——

(c) Address and location of production plants or stations in Idaho: ——.

(d) Name and address of managing agent: ——.

(e) 1. Names and addresses of persons composing firm or partnership constituting Producer: ——.

2. Producer is a corporation, organized under the laws of the State of ——, with its principal place of business at ——, and authorized to transact business under the corporate name of ——; that the following are the names and addresses of its officers, directors, resident general agent, and attorney-in-fact, to-wit: ——.

(f) Said Producer attaches hereto, as a part of this certificate, copy of Articles of Incorporation, certified by Secretary of State of Idaho; and if a foreign corporation, in addition thereto, copies of State license and of designation of statutory agent so certified.

In witness whereof said producer has caused this certificate to be executed this — day of ——, 193-.

—— ——, by —— ——.

Attest: —— ——.

STATE OF ——,
County of ——, ss:

On this — day of ——, in the year ——, before me, ——, a Notary Public in and for the State of ——, personally appeared —— ——, known to me to be —— of the —— that executed the instrument and acknowledged to me that such —— executed the same.

—— ——, Notary Public for ——, Residing at ——.

STATE OF ——,
County of ——, ss:

—— ——, being first duly sworn, on oath says that he is —— of the Producer which executed the foregoing Certificate and as such is fully informed as to the matters and

facts therein set forth that he has read such Certificate and knows the contents thereof and that same is true as he verily believes.

——.

Subscribed and sworn to before me this — day of ——, 193-. ——, Notary Public for ——, residing at ——.

[fol. 162] By stipulation there were opened and identified by the Master and received in evidence as though read before him, the depositions of Robert A. Millikan, taken at New York City pursuant to stipulation, on September 5, 1931; the deposition of Irving Langmuir, taken at Schenectady, N. Y., on September 9, 1931, and the deposition of Markham Cheever, taken at New York City, on September 11, 1931, on behalf of the plaintiff.

Said depositions (reduced to narrative form) are as follows:

[fol. 163] ROBERT A. MILLIKAN, witness called on behalf of the plaintiff.

Direct examination.

By Mr. MacLane:

Residence, Pasadena, California; age 63; Director of the Norman Bridge Laboratory of Physics of the California Institute of Technology, Pasadena, California.

The major part of my activities have been in the field of electrical theory and practice. During the past ten years I have been directly engaged in research and teaching in this same field at the California Institute of Technology. My work in Physics has been recognized in a number of ways, among which I may mention the award of the Edison Medal of the American Institute of Electrical Engineers, the Faraday Medal by the London Chemical Society, and the Nobel Prize in Physics by the Nobel Prize Committee. I took my Doctor's Degree in Physics at Columbia University in 1895; then I attended the Universities of Jena and Gottingen, in Germany; and from the fall of 1896 until the fall of 1921 was engaged in research and teaching at the University of Chicago. • • •

The terms "electricity and electrical energy" are commonly used to designate a particular form of energy which has been found especially adapted for efficient transferring and for general use. Energy in this form is commonly called electricity or electrical energy, to distinguish it from energy in other familiar forms, such as heat energy, chemical energy, energy of falling water and other forms of mechanical energy.

The terms "generation", "manufacture" and "production" as applied to energy in the electrical form are merely convenient designations applied to one aspect of the process of transferring energy from some source in nature, such as falling water, for example, to some point where it may be usefully applied.

The various facilities used in the process of electrical supply are purely transferring devices. The falling water [fol. 164] pushes against the blades of a waterwheel, thus causing the shaft to revolve and with it the rotating portion of the electric generator. The power of the water is transferred mechanically along the shaft from the water-wheel to the generator continuously and essentially simultaneously with the demand upon the generator. The electric generator consists essentially of a system of conducting wires moving through a magnetic field. This process serves to transfer the mechanical energy of the motion to electrical energy in the wires. In this process of transfer of the energy from the mechanical to the electrical form, no material is required or consumed. The energy drawn from the water is merely changed from one form to another and passed along. The process through the generator is continuous and the action essentially simultaneously with the consumer's demand for energy.

There is a continuous electrical and electro-magnetic path or circuit between the windings in the generator and the windings in the consumer's motor or between the generator windings and the filament in an electric lamp or the electrodes in an electro-chemical cell. The entire electric system functions to transfer the force of the falling water to, and to apply it at, the point where it is to be utilized. Except as and during the period that energy is called for, and used at the final point of utilization, the electric generator neither receives from the water-wheel-shaft, nor delivers to the electric transmission line, any energy other than that

necessary to hold the equipment under constant rotation and electric charge in instant readiness to serve.

The entire combined process, mechanical, electrical and magnetic, is integral, continuous and essentially simultaneous, (or) instantaneous. Electricity travels approximately at the speed of light, 186,000 miles per second.

The power being transferred at any instant from the electric circuit existing between an electric generator at [fol. 165] one place and a receiving device at another place, is calculable at any point in the circuit from the electrical pressure or voltage between wires, and the magnitude and characteristics of the electric current circulating in the wires, and is commonly expressed in kilowatts.

The kilowatt or one thousand watts is a measure of electric power. It is comparable to the horsepower by which mechanical power is measured. The horsepower is the power required to lift a 550 pound weight one foot in one second of time. A kilowatt is approximately four-thirds of a horsepower, and therefore is an expression of the power required to lift 737.6 pounds one foot in a second.

A "Kilowatt hour", the usual unit for measuring energy in the electrical form, is a mathematical product of the power relation in the electrical circuit between the generator and a receiving device measured in kilowatts, and the duration of time over which that utilization is measured in hours.

It is not possible to have a measurable kilowatt hour generated except as we have that kilowatt hour used somewhere in the system attached to the generator.

It is not possible to measure a kilowatt hour at any point in the electric circuit except as, if and when electric power is already in process of transference, and as we say, flowing over the wire.

Q. Is there a relationship between kilowatts or kilowatt hours generated and kilowatts or kilowatt hours consumed by the user?

A. Yes. The two are the same, except for the intervening so-called losses in the system, which more accurately might be termed "intervening system uses."

The so-called losses represent uses in the electrical system which are incidental and necessary to its functioning in accomplishing the energy transfer process. That is to

say, the transformers use a part of the generated electrical energy; the transmission lines a part; the distribution lines, a part, and so forth, in addition to the major part used by the consumer's appliances. Thus the amount generated [fol. 166] is at all times exactly equal to the sum of all these uses for the reason that these aggregate uses are reflected directly on the generator and the generator does not, and cannot, generate electricity in excess of the aggregate uses. There is no need of measuring them separately, but the total of system uses or so-called losses is reflected in the difference between the total generated and the total used by the consumers and measured to them.

Even at unlimited cost, it is impossible to construct a system which will operate without some system use or so-called loss. There must be a point of balance between theoretical perfection and economic practicability in the design of an electrical system. Engineers consider the practical results to be accomplished, and design a system which will accomplish these results with the greatest efficiency within practical limitations of cost and operating conditions. These so-called losses or system uses are therefore inherent and intentional in the system as designed. They may be closely determined in advance under any given condition of operation upon the system as designed and constructed.

For illustration, consider the analogy of energy being transformed in the mechanical form over a long line of shafting, to supply a consumer; bearings at intervals are essential to support the shaft in a straight line. There is no practical type of bearing, however, which, in some degree, does not resist the rotation of the shaft, due to the friction or rubbing of the shaft in its bearings. At each bearing a small portion of the mechanical energy being transmitted along the shaft is used to overcome this resistance. The amount of energy being delivered for the consumer's use is less than the amount delivered to the shaft by exactly the sum of all such incidental uses or so-called transmission losses. Without supplying these so-called losses, this process of energy transfer would of course be impossible.

The transfer of electrical energy should be differentiated from the transfer of any ponderable substance like water, or gas, or coal. Losses of the kind indicated by the ques-

tion are in general due to leakage or defects in the system, [fol. 167] or in the processes. Losses in an electrical transmitting system are essentially like, indeed quite the same, as frictional losses in the bearings of a mechanical transmitting system. They appear not as leakages or breakages of ponderable substances, but merely as heat losses. That is, they are inevitable system losses or system uses, if you prefer that term.

Q. Is electricity or electrical energy stored or capable of storage in an alternating current electrical system?

A. Electricity, as such, is, I think, not storable, strictly speaking, even in a direct current system involving storage batteries, i.e., in a storage battery system. What is actually done is to transfer electrical energy into the energy of chemical separation. Later when that storage battery is "discharged", to use the term in common practice, the process is again a transfer from chemical energy into electrical energy. Even that kind of use which is sometimes called "storage" is not possible with an alternating current system, at least commercially. I know of no case in which alternating current energy can properly be said to have been stored in commercially usable amount.

Q. Since you have differentiated an alternating current system, and a direct current system, will you explain in a few words the difference between these two forms of electrical systems?

A. In most, if not all, electrical generators, the wires in which the electrical energy starts to flow pass through the magnetic field, first, in one direction, and then in the opposite direction, and consequently in the so-called generator itself, even in so-called direct current systems, it is an alternating current that is generated rather than a direct current. In so-called direct current systems, however, these alternating currents in the windings are so arranged as to be brought into contact with what we call the positive and negative terminals of the transmitting line, synchronously with the changes in direction in the generator wire, so that the current in the external circuit, is, as we say, unidirectional. That means that the one wire of the transmitting line remains always positive with respect to the other. [fol. 168] That procedure is adopted in certain instances, because for certain types of commercial use such as charg-

ing so-called storage batteries, or running so-called direct current motors, it is essential to have unidirectional currents. For such uses as electric lighting and a great multitude of uses, such a change into direct current in the line from alternating current in the generator windings, is not necessary; indeed, the majority of commercial uses at the present time utilize what we call a. c. instead of d. c. current. Alternating current differs from direct current in that the positive and negative phases change, in each element of the wire, as the current passes over it.

Q. When a consumer, in the use of an alternating current system, throws in his switch to connect his motor, does he get in response to his action electricity already generated and stored in the line?

A. No. He causes the amount of electricity represented by the demand of his motor to be generated at the generator and transmitted over the line in direct response to his demand. In this, the electrical system differs from a water main or gas pipe system with storage facilities from which the consumer may draw water, or gas, for a prolonged period from what is already in the main or pipe system. As I have already said in effect, the electrical system—that is the generators, lines and transformers—does not operate as a storage battery, but as a device for the immediate transference of energy from its source in nature to its point of use, when, as and, if the consumer required it.

Q. Assume, if you please, a power station, which we will call A, connected to a transmission line extending to a consuming device, such as a motor, which we will call B, which device uses all of the power generated by Station A. Will you illustrate what has been said before by describing the relations between the generating station and the consuming devices?

A. Other than supplying the so-called losses incident to maintaining the system under electric charge, the generator at A runs idly, except as the consuming device at B is [fol. 169] using power or electricity; and when it is so using power or electricity, the process of generation, transmission, and use, is integral in the sense of simultaneousness regardless of the distance of transmission within any presently known commercial limits; the whole system must operate essentially simultaneously, or not at all. * * *

In the commercial generation, transmission and distribution of electricity, the process is essentially unchanged. Electricity generated at different stations may for commercial convenience, reliability of service, and similar factors, be brought together at one or more distributing stations or sub-stations, as they are sometimes called, from which it is in turn distributed over different lines to the consumers' different points of use.

If no consumer is using power from any distribution line, no demand is placed on the generators, and no electricity is generated except as above stated—that necessary to hold the equipment under rotation and electric charge. If the aggregate demand of the various consuming devices of the different consumers is less than the capacity of the generators, that part of the generating equipment which is not required to serve the immediate present aggregate demands of the various consumers, remains idle, or delivers only such power or electricity as is required to meet the aggregate demands of the consumers.

Under such conditions meters placed at the generating station register the power output (subject to so-called losses or system uses) required to meet the then aggregate demands of all the consumers. They afford measurements of generation, because the two are correlative.

Except for the uses in the system, or so-called losses, such meters placed at the point of generation will not register any output in kilowatt hours or otherwise, except as the consumers at the same time are utilizing such kilowatt hours.

As to any kilowatt hour produced for barter, sale or exchange, that is for delivery to some consumer, it is not possible to measure the kilowatts or kilowatt hour generated in response to such consumers' demand except as such kilo- [fol. 170] watt hour has actually been delivered to the consumer.

Q. What is the function of "step up" transformers placed at the generating station, and "step down" transformers placed at the consumer's point of use, or some intermediate point, in the process above described?

A. The various processes involved in stepping up and stepping down voltage through transformers, involve no change in the essential nature of the electrical processes which I have previously described. They are merely de-

vices adapted to the needs of the particular situation, developed primarily with the view to efficiency and economy in operation. For illustration, electricity could be generated at 6600 volts, and economically transmitted for a distance of a few miles, and used by the consumer whose motors are operated by that voltage, without any process of voltage transformation at either end of the circuit. This would probably be done under such conditions of transmission and use; but as distances of transmission increase, transmission at such a relatively low voltage involves either excessive size of conductors or excessive losses in transmission, and the economic and practical thing to do is to step up the voltage, that is, increase the pressure, for the sake of economy in transmission. The transformers, therefore, are merely an aid to the transmission of energy in the electrical form or what we call electricity.

Q. Is there any analogy between an electrical system in generating, transmitting and delivering energy in an electrical form, and a mechanical system for the transference of energy?

A. The whole electrical system is merely a device for transferring the energy of falling water from the point at which it falls to some other point under conditions for more convenient and efficient use. In principle this transfer might be done by a water-wheel and shaft, or a pulley and belt, or any other mechanical agency for transferring energy from one point to another, as well as by an electrical system. If it were so transferred, for example, the energy [fol. 171] transmitted by the belt in a given time will be measured by the pull on the belt, its speed of travel and the total time.

Cross-examination.

By Mr. Barber:

In this transfer of energy by an electrical system, we have a transformation also from the energy in the falling water to energy in another state, which is more readily usable by the consumer or user. In other words, we might and do, by a gravity system, no pumps intervening, transfer the energy of falling water to the faucet in the housewife's sink, and she has the energy of falling water available at that point; but she can not employ it for the opera-

tion of her radio or the motor in her carpet sweeper or the operation of her electric range or the lighting system. The great amount of the mechanical work represented by motors and our modern lighting systems, such as employed in an office building, the operation of elevators, radio systems and Doctor's X-Rays are dependent in our modern day life upon this conversion from the mechanical, generally, into electrical form.

Q. Would you state that electricity or electrical energy had any material substance?

A. No. Energy is not a substance. Its dimensions are those of work which is force times distance. Perhaps the simplest illustration I can use to make these relations clear to the non-technical mind, is to say that in the ultimate analysis, electrical energy, mechanical energy and all other forms of energy, are of the nature of heat. The ordinary man knows that heat is not a substance. In this particular, electricity is precisely like heat. It is wholly convertible into heat. So is mechanical energy also convertible into heat. The analogy I want is the relation between heat and electricity, as most people think they know what heat is and do not understand electricity; but there is nothing more mysterious about electricity than about heat.

Q. Is not there some theory * * * about the composition of atoms, as made up of electrons?

[fol. 172] A. Yes. They attribute mass to the electron. The electron is the ultimate unit of electricity.

We do not notice the presence of the electron and the ion in the mechanical energy in the revolving shaft from the turbine wheel to the rotor. What we notice is simply the heat that is produced when the electrical energy becomes transformed into heat in the conductors.

Q. We might state simply that by the transfer or transformation of mechanical energy into electrical energy we have something with a new name, with different physical characteristics and adapted to new and different uses?

A. Yes. I would prefer to change the form a little bit and say that you have mechanical energy transformed into a new form of energy which is adapted better to certain types of uses than the mechanical energy was. In some instances, uses to which we are not now able to apply mechanical energy. And in others, in order to get a greater

facility or a lack of noise or odor or a more flexible control.

Q. Would you say that from a practical point of view, electrical energy is consumed by the device of the consumer?

A. Consumed in this sense, that the customer receives a certain amount of electrical energy, and as a result his appliance does the work that he wants to have done with it. And in the practical operations of an ordinary electrical system, the meter at the customer's shop or house measures the quantity or volume or amount of electric energy which he receives. Its use is determined by his desires as between one device and another. The generating station has no control over that choice between different uses at all. The user may want heat energy, as in an electrical cooker, or he may want mechanical work, and the generating system has no means of differentiating or controlling such customer's uses. • • •

In the case of alternating current, the current reverses its direction of flow in the line in the alternating system; at least, that is the way we usually describe it. Between [fol. 173] these reversals or cycles, there is a point of time at which there is no current flowing.

Q. In practical operations a generator produces only in response to a demand; but would you say that the generator was physically incapable of producing anything except when there is some demand or use either by a device or by the system itself with its incidental losses, such as grounds, etc.?

A. Yes, that is a correct statement. In an electrical system, such as a water fall, for example, so as to keep in concrete terms rather than general terms, the transfer from the falling water into electrical energy in the system can only be made when the electrical system can in some way or other dispose of that electrical energy. It might waste it all in grounds; in the useless generation of heat, but in general the energy cannot flow into an electrical system from the water fall unless some method of use of that electrical energy is provided.

Q. If the governor on a generator were jammed so as to permit the full head of water to continue to exert itself against the turbine and at the same time the wires were out between the generator and the station bus, the generator would burn itself up and destroy itself, would it not?

A. No. If the circuit were open, as I understand your question, there could be no transfer of the energy of the falling water in the electrical form except as indicated in my testimony, that small amount necessary to keep the system in electrical charge.

Q. As I understand it, the output of the generator measured in practical terms of the amount of work that it would accomplish is measurable or calculable only at the generator, and at any other point along the distribution or transmission lines you get a lesser amount because of what you have spoken of as, in popular terms, losses between the generator and such remote point of measurement? • • •

A. Yes; less by the amount of what we call the line losses [fol. 174] or the system uses. There is a greater amount of mechanical work possible at the locality of the station than there is at any remote point.

The kilowatt hour is the common unit of measurement of electrical energy. Measurement at the station between the generator and the bus would be the first practical point of measurement of the output of the generator.

The man in charge of the transmission line, by opening or closing of different switches, will render the output of a certain station available to consumers over that transmission net-work.

Q. The mere operation of the generator or the conduct of any man at that plant cannot control the route of that energy over the transmission net-work?

A. I understand that to be differentiating sharply between the man who controls the generator and the man who controls the transmission net-work, and my answer is that the control of the routing of the energy is in the transmission net-work and not in the hands of the man who is in control of the generator. The amount of energy or the percentage of the output of a plant which reaches the consumers and is put to beneficial use or employment is dependent upon the character or construction of the transmission line and of the equipment, such as transformers used in connection therewith, and upon the efficiency of maintenance and insulation and the like characteristics of the transmitting line.

In the generation of electrical energy it is given certain definite characteristics with relation to voltage and to fre-

quency. There is no one definite frequency or voltage that is essentially inherent in generation, but they depend upon the character or characteristics of the devices employed by man, represented particularly by the generator and the receiving device.

Q. We were referring to the transfer of electrical energy as likened to a transfer of mechanical energy by a water-wheel, pulley and belt. This analogy is subject to the same [fol. 175] explanation as that of the transfer of energy by taking the water itself to another point where the fall of that water would give a certain amount of energy, in that it is not adapted to use in those devices common to our office and shop and home, where we now employ electrical energy?

A. Yes. In that particular the analogy is correct. It is not complete, however, because in the case of the transfer of mechanical energy through a shaft, or pulley and belt, as in the case of the transfer of electrical energy, there is no transport of material substance. In the case of the transfer of the water through pipes to and in the point of use or to a point of use remote from the fall, there is transport of material. In those particulars the analogy would then fail.

Q. But the energy represented by or made available by the moving belt would not without a transformation from mechanical energy into electrical energy operate a radio or an X-Ray or many other devices now operated by electrical energy?

A. No, not at the receiving station.

Q. You were speaking of the practically instantaneous response of the generator to increased demands upon the system. That response comes from the automatic adjustment of the valves which control the head of water admitted to the turbine through certain mechanical devices which man has adapted to the purpose, does it not?

A. Not wholly and not instantaneously. The point I am wishing to bring out here is that when a switch is closed and the demand for electrical energy put on the line by the consumer, the energy that begins to flow practically instantaneously into his consuming device is supplied by the mechanical energy of rotation of the rotating parts during the brief instant required for the automatic valves to open, so that more energy of falling water can enter the water

wheel. In other words, this problem as I see it, has no relation to the problem of the storage of electrical energy as such in the electrical system. It is a mechanical matter. That response follows from the particular devices and mechanical design of machinery which man has adapted to gain that automatic adjustment to the increased load upon the wire.

[fol. 176] Redirect examination.

By Mr. MacLane:

Any alternating current which by definition is a current which changes direction once every half cycle, must at the instant at which the change of direction is taking place, pass at each point in the circuit through a point of time at which the current is flowing neither to right nor to left, at which there is no current. That happens in a 60 cycle system 120 times a second.

Q. In the meantime, any given quantity of electricity, if I may use such a term, such as for example a kilowatt is travelling at the rate of 186,000 miles a second, I believe you stated?

A. Approximately. In a practical system it would be a little less than that, but so little as to be negligible from our point of view.

Q. Consequently, you do not mean that that particular instantaneous kilowatt of power travelling at that rate changes its direction of flow before it gets to the consumer?

A. No.

Q. A question was asked—I cannot repeat the exact question—but your answer to the question was that under certain conditions electricity might be wasted through the useless evolution of heat. I assume that you referred there to such a condition as would exist as the result of a short circuit or some such thing?

A. To grounds or short circuits, which amount to the same thing. Whether useful or not, the electricity generated is in some way used just as at the time it is being generated. * * *

The effect of leaving the governing gates wide open so that the turbine would admit all the water which it was designed to pass through it, and the generator itself was

not connected to any transmission system or receiving device, would be to cause the generator to race until all the energy of the falling water is consumed in heat evolved in bearings, and so forth. If that were continued for an undue length of time, the generator would destroy itself through the operation of centrifugal force. Or else its bearings would get so hot that they would absorb all the energy of [fol. 177] the falling water. That would be mechanical energy so absorbed. Under such conditions, no electrical energy would be generated other than that required to charge the capacity of the system. If, on the other hand, a short circuit of sufficient intensity or magnitude should occur, the generator then might burn itself up electrically.

Q. Some reference was made to losses dependent upon use and varying with the distance of transmission. Losses of that character are purely the resistance losses of the copper or other conductor, are they not?

A. Practically so. There is a little bit of what we call electro magnetic radiation from the wires, which goes off, but it is practically all heat losses. These resistance losses vary proportionately with the demand imposed by the consumers upon the system. In addition to the resistance losses there are so-called iron or transformer losses. These losses, or uses, the iron losses, are not proportioned to the consumer's use. In a minute degree they may be dependent upon, but not proportional. To the first approximation they are independent, though not quite rigorously so. These transformer uses, or transformer losses, are incidental to keeping the magnetic field energized. They are called hysteresis losses and result in heating of the iron cores. They are part of an electrical system. And similarly, they are not in any way proportional to distance of transmission as such.

[fol. 178] Irving Langmuir, a witness on behalf of the Plaintiff, testified as follows:

Direct examination.

By Mr. MacLane:

Residence, 1176 Stratford Road, Schenectady; Age 50; Research Physicist and Chemist and Engineer, employed

by the General Electric Company as Associate Director of the Research Laboratory of that Company in experimental work in connection with the practical application of the science of electricity to the arts and industry.

I graduated from Columbia University in 1903 and then did two and one-half years post-graduate work at the University of Goettingen in Germany where I specialized in physics and mathematics and chemistry. I have been in the Research Laboratory of the General Electric Company since 1909, and the major part of my work has been concerned directly with researches on electrical problems. For many years I worked on incandescent tungsten filament lamps and then devoted most of my time for several years to the development of the present day radio tubes and many of the circuits in connection with radio receiving and transmitting sets. At the present time I am engaged largely in developing electrical devices containing gas which are being used for the control of electric power. My work for the last twenty years or more has been directly in connection with the application of scientific theories to practical electrical problems.

I have received honorary Degrees from some six or eight universities, and have received several medals, among which are the Rumford Medal given by the American Academy of Arts and Sciences; the Hughes Medal, from the Royal Society of London. I have been President of the American Institute of Radio Engineers.

Q. In this discussion which we are now going to undertake we will wish you to describe accurately and so far as possible simply, some of the problems involved in the practical utilization of energy taken from Nature. As a basis for the discussion we may require some definitions. Will you describe energy in its various forms, as that term is [fol. 179] used in physical science, and the arts dependent on it?

A. Energy is a measure of the ability to do work, and by "work" I mean mechanical work.

There are many forms of energy, for example, mechanical energy. A very familiar form of mechanical energy is kinetic energy which is the energy of a moving body which it possesses by virtue of its motion. A familiar example of this is the energy of a rapidly moving

automobile. After water is falling its energy is kinetic, but before the water has started to fall it possesses what is called "potential energy." That is, it has the ability to do work because of its position, and this may also be called "gravitational energy" because it is readily rendered available by the earth's gravitation and attraction on the water.

All of these various forms of energy, among which I must also include electrical energy, are convertible one into the other and have a tendency to ultimately go over into the form of heat energy.

One of the most important natural laws that has been discovered by mankind is known as the principle of the conservation of energy, according to which energy cannot be created nor destroyed but can merely be transformed or converted from one form to another. So the total energy in the world is constant and definite except insofar as the earth receives energy from the sun, or loses it by radiation out into space.

Practically all of our energy is fundamentally derived from the energy that we receive from the sun.

Energy may be taken from its source in nature and transmitted to the desired point of useful application, in many ways. For example, mechanical energy, either originally as potential energy or kinetic energy, may be transmitted by means of a series of belts, or by means of a rotating shaft. It can also be transmitted by means of compressed air through a pipe line, or by means of water transmitted through a pipe line, the water being under pressure and its ability to do work being dependent on the pressure in the line at the point where it is to be used. The mere pressure, however, does not transmit energy. There must also be [fol. 180] a flow of water, and the amount of energy transmitted is measured as the product of the pressure and the amount of water that flows.

Commercially, the most important method of transmitting energy, as such, is by the electrical transmission of power. However, we must also consider that commercially on a large scale power is transmitted in the form of chemical energy, as, for example, by transporting fuel such as coal on railroad lines to the point of consumption.

Also we have the large scale transmission of power by pipe lines which transmit natural gas or fuel oil.

In these cases the chemical energy which is locked up in the fuel is transmitted from its point of origin over the railroad lines, or through the pipe lines, to the point where the fuel is burned or consumed and its chemical energy is released and is converted to heat energy which may be either used directly or may be used to generate electric power.

In the transfer of energy electrically from falling water to a distant point of use the water is usually in a reservoir at a high elevation. The water is allowed to flow to a point at a lower elevation, and in so doing the potential or gravitational energy is automatically transformed into kinetic energy, which means that the water is set into rapid motion at some point along its path. At this point, a turbine is interposed whose blades receive the impact of the rapidly moving water and the kinetic energy of the water is delivered to the shaft of the turbine in the form of mechanical energy.

Connected also to this rotating shaft is an electric generator in which copper conductors are made to move across a magnetic field which is maintained in the generator by separate excitation of its field coils. This action causes electric current to flow in the conductors in the generator and not only causes the electric current to flow, but forces it to flow with a high pressure which is measured by the voltage of the current that is generated.

The power which was originally present in the water is now electrical power, but just as in the case of the flow of [fol. 181] water which I spoke of a little while ago there can be no electric power except insofar as current flows. Mere electric pressure does not produce power. There would therefore be no electric power generated unless the current from the generator is allowed to flow away from the generator through electric circuit. Ordinarily, this involves a transmission line, usually having three conductors. At the further end of the transmission line there are usually transformers which control the voltage for use in distribution to the consumers. Each consumer converts this electric energy into some other form of energy which is suitable to his needs.

For example, one consumer may wish heat for cooking, or even for house heating. Another wishes mechanical

energy which he obtains by using motors. Others may wish to use the electric energy in chemical form, or in what are called electro-chemical processes for the manufacture of various chemical substances; or he may wish to use it for the operation of a radio set, and other numerous applications with which we are familiar.

In all of these cases the electrical energy is converted into some other form of energy which the consumer desires.

Q. Then, as I understand you, the energy present in Nature at the source is not electrical energy but is another form of energy, and the energy used by the consumer, actually used and applied by the consumer at the place where he receives it is not electrical energy, but that the energy is in the electrical form only during the period of its transmittal or transmission from the generator at one end to the so-called consuming device such as motor, lamp, or similar device at the other end?

A. That is practically always true. The energy originally present in Nature is never in practical cases present as electrical energy. Man converts this energy available through Nature into electrical energy, transmits it to the consumer, and the consumer there takes the electrical energy and consumes it by converting it into some other form of useful energy.

The electric generator cannot function to produce or generate or transfer from another form into the electrical [fol. 182] form electric energy beyond that required by the electrical system itself to keep it in charge, except when, as, and if, the consumer is conversely converting the energy into some other form than electrical at his end of the circuit.

The electrical phase of this process of transferring energy from Nature to a distant point commences in the electric generator. * * * I would regard the passage of the electrical conductors across the magnetic field produced by the field coils as the factor primarily responsible for the generation of electrical power. The whole design of the generator is such as to permit this action to take place under controlled conditions.

As I said before, however, the power is generated not because the conductors pass through this magnetic field, but because the current is permitted to flow through these con-

ductors when these wires pass through the magnetic field. The power is generated only insofar as the current flows through the generator, and whether or not current flows depends upon whether power is consumed at other points in the distributing system or in the transmission line.

Q. Then this electrical phase commences definitely at some point within the generator and before the current may be said to have left the generator; is that correct?

A. Yes. Of course by "point" you mean a large fraction of the generator because the generator is pretty well filled with electric conductors.

Q. At what point does the electrical phase of the process of transferring energy end?

A. The energy is transferred over a transmission line and over a distributing system to the consumer. The whole process ends when the consumer converts this energy into some other form of energy.

Whereas the generators are usually small in number and very large in size, the consumption of the electric power takes place in enormous numbers of relatively small size units of a wide variety of types.

Q. Then would it be proper to say that the path or con- [fol. 183] duit for the transfer of electricity has its origin within the generator and is continuous from that point to a point within the consumer's motor or similar consuming device?

A. As a practical matter it is continuous from the generating station to the consumer device, although as a matter of fact, there may be interposed transformers which raise or lower the voltage along the line between these two ends. The action in these transformers, however, is electrical and constitutes practically a gearing device such as exists in the transmission line of an automobile. The action of the transformers is very much like that of the gears in the automobile which permit the engine speed and the speed of the wheels to be varied in any definite ratio which may be desired.

There is no interruption, by reason of these transformers, of the continuity of the flow of the electrical power. The current, however, that comes in one end of a transformer is kept separate from the current which goes out of the other end, the secondary end of the transformer, but

the electric power flows continuously through the transformer, and that power is what the consumer gets.

Q. Is there any point between the commencement of the electrical phase of the transfer of energy in this form and its end that the process of transference may be interrupted without destroying it entirely?

A. No it cannot be interrupted for more than a few thousandths of a second without destroying the whole operation of the transmitting system.

Q. And in the transmission system, as you used the term in the last answer, you included the generating station and consuming device?

A. Yes—as distinguished from what is technically called the transmission line.

Q. Can any part of this electrical process function independently. That is, can the generator function independent of the consumer's motor or other consuming device?

A. No, they are inherently and essentially dependent on one another just as though they were geared together. [fol. 184] * * * The velocity with which electric power is transmitted along a transmission line is practically the same as the velocity of light, which is one hundred and eighty-six thousand miles per second. That is, the transmission from all practical points of view must be considered as instantaneous, so that the generation and consumption of power occur simultaneously.

Q. Does the electrical system itself utilize any part of what we commonly refer to as the generated electricity?

A. Yes. In order to maintain the whole electrical system in operating condition, it is necessary, for example, that the field coils of the generator shall be continuously excited. That is, the magnetic field in the generator must be maintained even if no current is generated or no electrical power is generated by the generator itself. Similarly, the action of the transformer requires that the iron of the transformer shall be magnetized.

To maintain these magnetic fields requires the expenditure of a certain amount of energy, a relatively small fraction to the whole energy which is transmitted or generated.

In a similar way to transmit electrical power over a transmission line requires the expenditure of a certain amount of electrical energy. There is, so to speak, a cer-

tain electrical friction when a current passes through a wire. In order to maintain the flow of current, it is therefore necessary to have a certain electrical pressure to maintain this flow. This involves the expenditure of a certain amount of electrical power. This is really the use of electrical power for the purpose of transmitting the power over the line. It is usually referred to as a loss because it cannot be charged for by the power company. It should, however, really be regarded not as a loss but as the expenditure of electrical energy for the purpose of transmitting power over the line.

It is entirely analogous to the coal that would be consumed in a locomotive of a train which hauls coal from a mine to a distant point where the coal is consumed. The coal in the locomotive must be expended for the purpose of transporting the larger amount of coal carried by the [fol. 185] train.

So in an electrical line a certain fraction of electrical power must be expended in order to transfer or transmit the larger amount of useful power to the further end of the transmission line.

The word "losses" as commonly used in electric station parlance to describe these uses which I have referred to, connotes commercial loss rather than loss in a physical sense. In no sense is there a useless loss of power. That is, the power doesn't leak out of the line or is not lost the way water would be lost that leaks out of a pipe line. It is not a material substance that is lost. It is merely the voltage or pressure that is lost and that is used in transmitting the power.

Q. Just very briefly what is meant by direct current or a DC system, and alternating current, or an AC system?

A. When the copper conductors in the generator rotate through the magnetic field they first pass through a magnetic field having one direction, and then as they move further in their rotation they pass through a second field having the opposite direction. They do this periodically as the shaft of the generator rotates. The result is that the electrical pressure which is produced by the generator and which is measured in volts, first tends to force the current in one direction and then immediately afterwards reverses

its direction so as to tend to force the current in the opposite direction. This action takes place, as I said, periodically and, in the alternating current ordinarily used in practice, takes place sixty times per second. That is, the complete cycle consists of a pulse of current in one direction followed by an equal pulse in the opposite direction, a period of one-one hundred and twentieth of a second elapsing between the peaks of these two pulses.

If the generator is connected up directly with the transmission line or with the transformers that fit into the transmission line, the current that is generated is thus an alternating current. It consists of a series of pulses or waves alternating in direction.

For some applications of electric power it is undesirable [fol. 186] to have these reversals in the direction of the current occur. In that case a special device is used with the generator called a commutator to take out the pulses of current that occur in one of the two directions and to reverse their direction, with the result that the flow of current now takes place in the line coming from the generator all in one direction. This is called a direct current. Instead of having a commutator on the generator, it is possible to convert alternating current at any point in the distributing system by using what is called a rectifier. Many systems of electrification of railroads involve the use of these rectifiers so that direct current can be transmitted over the trolley to the moving train.

Q. Has the alternation of direction of flow of current in alternating current systems got anything to do with the direction of the flow of power from generator to consumer?

A. No. These alternations that I speak of are not alternations along the line, but are simply alternations in time. That is, at any one place at successive time intervals the magnitude of the voltage changes from a positive to a negative flow, but there is no direction involved in either the voltage or the character of the alternating current.

I said some time ago that it is customary to use three wires on a transmission line. This is done for the purpose of transmitting three-phase current. When this is done the flow of power is steady and continuous; that is, if the devices used by the consumer are capable of consuming a steady flow of power. Any one of the three wires carries

current which first flows in one direction, rises gradually to a maximum, falls to zero, reverses in direction, passes through a maximum in that second direction and again decreases to zero, this whole action occurring in one sixtieth of a second. At certain instants of time the current through any one of the conductors thus falls to zero. However, the three wires are used in such a way that just as the current transmitted over one wire falls to zero, the other two wires are carrying a maximum current. The net result is that the sum of the three currents carried over the three wires always balances exactly. That is, the current flowing on two of the wires just balances the current flowing [Vol. 187] on the third wire. The flow of current and the flow of power are thus steady and continuous taken over the three wires considered together. The consumer gets both current and power, but the current is simply a means of carrying the power. What he wants is power.

The flow of power is uni-direction in an AC as well as a DC system.

The ordinary commercial system for the generation, transmission, and delivery of electricity in use today is an AC system, and only in special instances such as for the running of elevators, or in some cases street cars, and a few other special uses is direct current applied.

Q. Can electricity or electrical energy be stored from an alternating current system?

A. No. There is no practical way to store any appreciable amount of electrical power in an A. C. system.

Storage batteries are charged with direct current and the power of the direct current is transformed into chemical energy which later can be converted by the storage back into direct current electrical energy.

Even in such cases there really is not a storage of electricity in any true sense. This is a storage of power, but not electrical power.

In electrical systems there may be a minute amount of electrical energy stored in the form of magnetic fields in the transformers and generators and the magnetic fields around the conductors, on the transmission lines, and, in some cases capacitators may be used which are capable of storing relatively small amounts of energy. The total amount of energy stored in this way, however, would only

be sufficient to keep the system in operation for a few thousandths of a second, usually much less than one-one hundredth of a second.

Q. When a consumer from an alternating current electrical system demands the delivery of electric energy or power by pushing a button or throwing a switch, is the power or energy which is instantly delivered to him in response to his action power or energy stored in the system, or is it not?

[fol. 188] A. No. When he closes the switch, the current and power that flow as a result through the device that he thus connects are immediately drawn from the generator. That is, any current which he draws from the line causes an immediate and simultaneous increase in the current delivered by the generator, and this in turn causes more water to flow to the generator. This action is entirely automatic. In fact, the successful operation of a power station and the maintenance of constant frequency require that the rate of rotation of the generator shaft shall be kept absolutely constant. When more power is drawn and thus more current flows through the generator, the tendency would be to slow down the generator. This must be automatically prevented by a governor which allows a greater flow of water to maintain a constant speed of rotation. This, however, necessarily means that more power is drawn from the potential energy of the water in the reservoir in direct response to the power consumed. * * *

Electrical power is ordinarily measured in kilowatts.

With the direct current the fundamental unit of power is the watt, which is one one-thousandth of a kilowatt. The power in watts is simply the product of the current measured in amperes and the pressure measured in volts. This illustrates the fact which I have mentioned before that no power can flow unless current flows, but the amount of power that flows when any given current flows is proportional to the pressure or voltage. In other words, it is the product of these two quantities.

Similarly, with alternating current, power is proportional to the current and the voltage, but in this case there is a factor which is usually called the power factor, which is less than unity, which is needed to allow for the fact that the current and the voltage do not necessarily follow one

another exactly. That is, there may be a slight time lag between the two. The main point, however, is that again the flow of power is proportional to the product of the current and the voltage.

Since the kilowatt is a measure of power it is equivalent [fol. 189] to mechanical power which is usually measured in horsepower. I say "equivalent" in the sense that one can be converted into the other. However, the units are somewhat different so that actually a kilowatt is equivalent to about one and one-third horsepower of mechanical energy.

Power measures the rate of doing work. Naturally, a consumer must pay not for the rate at which it does work but the total amount of work done. That is, the longer the time interval during which power is consumed, the greater amount he must pay. Therefore, as a practical unit of charge to measure the energy consumed, the kilowatt hour is adopted. If one kilowatt is consumed for one hour, this means that one kilowatt hour has been consumed. Or we might have one-half kilowatt for two hours, which would also be one kilowatt hour. In other words, the kilowatt hours represent the product of the time by the kilowatts.

You cannot measure a kilowatt hour at the generator or anywhere else upon the system except if, as, and when that kilowatt hour is delivered to and used by the consumer.

Q. Of course in this sense to be complete, meters at the generator will show the so-called output of such power as is required to keep the system in rotation and under charge?

A. Yes. At the generator the meters which measure kilowatt hours would show the total kilowatt hours consumed in the entire lines which would include the so-called losses along the line. But so far as kilowatt hours generated in response to consumers' demands are concerned they can be measured only if, as, and when they are actually demanded and consumed. The measurement is in kilowatt hours and that involves the measurement of current in amperes, voltage and time. It is the product of these three that determines the power consumed.

As I said before, no current can flow in one part of the system without involving current flow through other parts of the system. The recording of the kilowatt hours on the meter at the generator station is thus simultaneous with the consumption of the power at the other points along the

line beyond the generating station. This is necessarily [fol. 190] the case because there is no storage of electricity.

The case is quite different from what it would be if you were measuring the flow of oil or water or coal which was being transported or transmitted for power purposes. In that case the amount of material passing a given point is not necessarily the same as that which is consumed at other points because there may be and usually is a very great storage of material along the way. The electrical system is much more closely related to the system of belts or transmission of power along a shaft where the input and output are inherently tied together. For example, the transmission shaft of the automobile is quite similar in this respect to that of an electrical transmitting system. If an automobile comes to a hill so that more work is required to turn the wheels and push the automobile up the hill, immediately and necessarily more power must be consumed or must be produced by the engine if the speed is to be maintained constant. The essential point of similarity in this case is that there is no energy stored anywhere along a transmission shaft between the engine and the wheels and therefore there is an immediate response between the power consumed and the power generated, just as there is in the electrical transmission system.

Q. While the results accomplished are somewhat different, what is the difference in principle between generation, transmission, and delivery of electric power and energy and the initiation, communication, and reception of telephone or telegraph messages.

A. I should say that there is a close similarity between these two systems. The generation and consumption of power are processes that are simultaneous and inherently dependent on one another. This is quite analagous to the action that occurs in a telephone line between the transmitting and receiving end. In the telephone line we have the energy of the sound waves in the air that are converted into electrical power which is transmitted over the telephone line to the receiving station, the receiving telephone, where it is again transformed into the energy of the sound waves which are suitable for producing the desired effect on the ear of the listener.

We know that in this case the enormous speed with which [fol. 191] electrical impulses can be transmitted over wires makes the action between the receiving and transmitting ends simultaneous and inter-dependent.

In cases like this we see clearly that the character of the electrical system, by which it did not store energy, is of the utmost importance and differentiates this system from one in which energy storage might occur. If energy storage does occur, the time lag that would ensue between the action at the transmitting and receiving ends would interfere seriously with the transmission of speech.

In our power transmission lines we have this same characteristic, that the inter-linking of the generation and the consumption is rapid and practically complete.

Q. Is there a similar analogy between a power system and radio system consisting of the broadcasting devices at one end and the receiving set at the other?

A. Yes. The radio set is practically like the telephone transmitting system that we have just discussed, except for the additional radio link. That is, in the radio system the sound waves are transformed into electrical energy which is an alternating current having the same frequency of vibration as the sound waves. Then instead of transmitting this alternating current directly to the receiving end, it is transformed into radio waves which are sent out by a broadcasting station and these propagate through space to the receiving antennae. From there they come to the radio receiving set and are converted into alternating currents which act on a loud speaker in order to produce sound waves again. Between the microphone at the studio of the broadcasting station and the loud speaker in the home of the listener the action is wholly electrical and is similar to the power transmission system in regard to the velocity of propagation.

There is one distinct difference, however, between a radio broadcasting system and that of the power generation system in that the broadcasting station sends out into space a perfectly fixed and definite amount of energy regardless of whether the listener operates his receiving set or not. The energy sent out by the broadcasting station is dis- [fol. 192] sipated in space and only a minute fraction of it comes to the receiving set of the listener. The receiving

set then takes this minute amount of energy and by means of vacuum tube amplifiers builds up the energy back to the point where it is sufficient to operate that loud speaker.

In our power transmission system, however, the connection between the consumer and the generating station is almost infinitely more intimate than in the case of the radio broadcasting station. In the case of the radio station the losses are very much greater than the amount of power actually transmitted to the receiving system.

Q. Just one or two practical applications and I am through. Assume that a power station is located in one State, that a transmission line extends directly from that station across the State line into another State, and that at the terminus of that transmission line there is a consumer who uses the power output of the station. Can any power be generated by that station in the first State other than again is required to keep the system under rotation and in charge except in response to and simultaneous with a demand and use by the consumer in the second State?

A. No. And that is true whether there be in the second State one consumer or many thousand.

The amount of power generated by the station in the first State is always equal to the amount consumed by the consumers in the second State, again allowing for the so-called system uses.

It is not possible to measure a kilowatt hour of electricity or electrical energy at the generating station in the first State except, if, as, and when that kilowatt hour is also passing over that State line and being delivered to and used by the consumer in the second State.

Cross-examination.

By Mr. Barber:

Q. With reference to the analogy between the electrical transmission system for power, for instance, and telephone [fol. 193] or telegraph and radio, we have this practical difference, that in the one, the power system, we are transmitting energy and ability to do work, and in the other intelligence; that is, ideas or thoughts?

A. Either or both. It is only by means of the transmission of energy that you are able to get the thoughts across.

Q. Yes, but the user of the radio receiving set, or the receiver of a telegram, gets only the thoughts that are initiated at the sending station, while the customer and the user of the ordinary electric power system gets an ability to do work which he can utilize as he pleases as between one device and another, or to a slight or greater extent?

A. The electrical transmission of power gives a system of the utmost flexibility suitable for many different applications, whereas these other systems that you have mentioned are highly specialized, adapted for only a particular kind of use. In those cases where you say intelligence is to be transmitted, the efficiency of the power transferred becomes of minor importance, but it is only by the transmission of power that the intelligence can be transmitted because it is this electrical power which is converted into the sound waves which affect the ear of the listener.

Q. You distinguish sharply between electrical energy and energy in other forms with regard to the uses to which it may be applied by the consumer and the devices with which its use may be had, do you not?

A. Any sharp distinction depends upon what points of similarity or dis-similarity we wish to emphasize. In some ways they are essentially alike, and in other ways they are essentially different.

Q. You do not confuse the two in your mind. May I state that question this way: The same amount of energy may be transferred by a system of belts and pulleys, but before a consumer can use that in the devices which he has in his shop or home, it must first be transformed into electrical energy?

A. Not if he wants to use it as mechanical energy.

[fol. 194] Q. I should have referred to the lights, the electric range, and electric motors, and such other electrical devices as are now commonly employed for the use of electrical energy?

A. Yes that is true then.

It is generally true that for a great many uses or purposes electrical energy may be more readily applied, or a device may be operated with greater facility or control than would be possible with mechanical energy.

Q. At what point in the electrical system would you say the output of the generator might be practically measured?

A. Preferably close to the generator, and in any case naturally preferably before the power has been sub-divided into a large number of smaller units as in a distributing system. If you measure it close to the generator a single set of measuring instruments will suffice to measure the power, whereas if it is placed further away where the line is sub-divided it may be necessary to add the power consumed in each part of the system in order to obtain the total and it may then be necessary to add in also the power consumed in the distributing system itself. But necessarily that point of measurement must be after the power has left the generator.

Q. You spoke generally of the analogy between the dependency and connection of the generator and the consuming device and the gearing of mechanical devices. It is true, however, is it not that the generator is not dependent upon any one consuming device connected with the transmission net-work?

A. Well if there are many of them working on the same net-work it is dependent upon them altogether, but dependent on them individually only insofar as they are part of the whole.

Q. In other words, in a transmission net-work covering a considerable territory and to which a great number of devices are or may be connected, switches are opened and closed, and at one moment devices at one point are taking the output of the generator and at another moment perhaps devices many miles distant are taking that output, is that not true?

[fol. 195] A. It is true to some extent. That is, in many cases the average power consumed by a large number of small consumers may remain fairly steady even though the power consumed by the individuals is transient and be of an irregular nature. However, this smoothing out of the load by averaging is a very imperfect process and it is well known that one of the most serious problems of practically all power systems is the fact that this averaging is very incomplete and that the consumers use far more power during certain hours of the day than during other hours. It is this peak load when the larger number of consumers are taking power that makes it necessary for the power company to install far more generating equipment and

transmitting equipment than would be necessary if this averaging process that you refer to really averaged out the load to a steady flow, and by "far more" I mean several times more.

Q. Assuming more than one generating plant or station connected to a transmission net-work, the points of use of the energy from a specific station is in the control of the operations of the transmsision net-work, is it not?

* * * * * * *

A. If several generating stations are connected to a single net-work, the condition is usually then that the total power consumed by all the consumers connected with the net-work is not controllable by anyone connected with the power company; that the power company is to stand ready to deliver whatever power may be required of it.

It is possible, however, at any given time, at least when the peak load is not being consumed, to draw the power that is required from the net-work in varying proportions from the various generating stations. That is, if at any given time one hundred thousand kilowatts are needed from the distributing system and there are two generating stations available, they may draw fifty thousand kilowatts from each of these two stations, or they may decide to draw seventy-five thousand from one, and twenty-five thousand from the other. Usually, however, when the peak load is reached it is necessary to call upon all of the generating station- together in order to maintain the system in operating condition. In that case they have no choice of distributing the load between the various generating [fol. 196] stations.

Q. With regard to the practically instantaneous response of the generator to an increased load upon the wires, can you explain why that with a substantial and sudden increase in that load, lights which were burning at the time of increase being exerted dimmed for an instant?

A. If a relatively large amount of power is suddenly drawn from a certain part of the distributing system, an increased current is drawn through the conductors of that part of the distributing system, and these, in turn, draw more current from the transmission lines that feed into them. To cause this increased current to flow through the

conductors will require a somewhat greater voltage along the copper conductors and since the generating station usually generates a practically fixed voltage, this increase in voltage along the line will mean a decreased voltage at the terminal of the line.

Usually, special devices are introduced along the line in a distributing system, particularly to compensate for this effect and to bring the voltage back as quickly as possible to its normal flow. Such regulating devices are not necessarily instantaneous in their action, but may require a fraction of a second to operate.

If an extremely large amount of power were suddenly drawn so that it represented a considerable fraction of the total power generated, the increased current which would be immediately drawn by the generator might slow down the generator slightly until such time as the governor or governing mechanism of the generator is able to increase the flow of water in the turbine feeding the generator.

These time lags are primarily dependent upon the character of the regulating apparatus used in the generator, transmission line, and distributing systems, and are not the result of the storage of energy in the transmission system itself.

I spoke of the fact of a sudden increase in the demand of power on the generator affecting the speed of the generator. The large kinetic energy of the rotating parts of the gen- [fol. 197] erator which act like a fly wheel tend to maintain constant speed of rotation for short intervals of time before the regulating devices have come into action. But, of course, the steadying effect of this kinetic energy on the rotating parts is limited in magnitude and, therefore, may not always function perfectly in case a very large amount of power is suddenly drawn.

Q. With regard to the so-called system uses, sometimes referred to as "system losses" these, as I understand it, are inherent in the operation of the system, but not all of them essential to its operation, is that not true? I refer particularly to such losses as arise from faulty insulation.

A. Well, those that are essential I do consider inherent. It seems to me that your use of these words is contrary to the ordinary use.

Besides the drop in voltage along the line required to force the current to flow, there may be power loss or power

consumed through defects in the system. However, I think that these losses, which may more properly be called losses, are negligible in amount and are not at all inherent; at least, not in appreciable amount.

In general the percentage of power generated by a station which is built to supply the power for the consuming devices of customers is dependent upon the character of construction of the transmission network and distribution network and the efficiency of its maintenance.

Redirect examination.

By Mr. MacLane:

Q. Doctor Langmuir, this momentary flicker of lights to which counsel has referred is due altogether, is it not, to a drop of voltage or pressure at the point of use rather than to other cause?

A. The immediate cause of the dimming of the lights is a decrease in the voltage at the point where the light is connected, but the loss of voltage itself of course is caused by those causes such as I have already mentioned.

[fol. 198] Q. In ordinary operation of a well constructed and adequate system, is that due to local causes in what I might term the consumers' part of the system; that is, the part that is on his side of the transformer which is immediately serving him, or is it represented by a corresponding drop in voltage in the system as a whole?

A. Oh, in practically all cases it is due to a drop in voltage along the lines owned by the consumer himself. For example, I know that in my own house when my refrigerator goes on and off there is a momentary change in the brightness of the lamps in the house, but I never have been able to observe any effects caused by the refrigerators in my neighbors' houses. This fact that I have observed I am sure is due to drop in voltage within my own house and the leads running from there to the street.

Q. Now with respect to the delivery of power in a commercial system consisting of generating stations, transmission lines, and distributing system, having furnished the facilities and placed them under electrical charge, what has the company which furnishes the power got further to do with deliveries to the consumer?

A. The responsibility of the producer of power involves the maintenance of reasonably constant voltage and frequency at the point of connection with the consumers' circuits. To guarantee that this can be done involves the maintenance of generating, transmitting, and distributing equipment sufficient to meet the maximum demand which a consumer may require. That is, the power producing company must maintain constant voltage and frequency if and when the consumer draws the maximum amount of power that he is permitted to draw under the agreement with the company.

To summarize, the company maintains installed capacity at the generators and elsewhere in the system, voltage, and frequency in its circuits, and the consumer does the rest.

[fol. 199] MARKHAM CHEEVER, a witness called on behalf of the plaintiff, testified:

Direct examination.

By Mr. MacLane:

I reside in New York City; I am 51 years old; I am a Vice-President of the American & Foreign Power Company, with headquarters in New York City, and having general charge of the electrical developments of the subsidiary companies of the American & Foreign Power Company; I am an Electrical Engineer by profession; I graduated from the University of Michigan in Mechanical and Electrical Engineering in 1903, and since that time I have been continuously engaged in the design, construction, operation and supervision of electric power properties.

I am familiar with the properties of the Utah Power & Light Company, the plaintiff in this case. One of the principal companies, predecessor to the Utah Power & Light Company, was the Telluride Power Company, which operated originally in Colorado and Utah. I was employed by the Telluride Power Company in 1906, and my first position was that of Construction Engineer in charge of the building of a hydro-electric power plant at Ames, in Southwestern Colorado. Upon the completion of the Ames plant in July, 1907, I was transferred to Grace, Idaho, where the

Telluride Power Company was commencing the construction of the first power plant upon Bear River, in Idaho. I was located at Grace during the heavy part of the construction, and was then made Assistant Chief Engineer of the Company, having contact with all of its properties. The Chief Engineer at that time was Mr. P. N. Nunn. I remained in that position until the Utah Power & Light Company was formed in 1912, and the property of the Telluride Power Company was transferred to it. I then became Chief Engineer of the Utah Power & Light Company. A few years later the duties of General Superintendent in charge of operation were added to those of Chief Engineer, and I remained in that position until the early part of 1926.

The properties of Telluride Power Company at the time they were taken over by Utah Power & Light Company consisted briefly of a comparatively small hydro-electric system in Southwestern Colorado, supplying the Telluride Mining [fol. 200] District and a more extensive system in Utah, extending from the Eureka Mining District, on the south, to Logan, Utah, just south of the Idaho state line, on the north. This Utah system was supplied principally by power plants in Provo and Logan Canyons, in Utah, and by the Grace plant, in Idaho, through two 44,000 volt transmission lines extending southerly from Grace to Logan, Utah.

The Telluride Power Company constructed the Grace plant solely to serve its customers in Utah. The Company at the time that construction was undertaken in 1907 had no business or customers in Idaho and did not contemplate having any at that time.

When the Grace plant was placed in operation, power was all transmitted to the company's system in Utah. This transmission was direct. There were at that time no uses of that power in Idaho other than those within the company's system itself, within the Grace Power Station, and also the necessary uses for charging the line and keeping the machine running at full speed.

In 1912 and during the subsequent two or two and a half years the Utah Power & Light Company acquired a number of other properties in addition to those of the Telluride Power Company, and shortly afterward extended service southward in Utah to the coal fields of Utah; so that early in its history the Utah Power & Light Company rendered

service throughout the thickly settled and industrial part of North Central Utah, and its system contained practically all of the power plants in that territory. There were thus acquired in Utah approximately 20 plants.

Some systems and plants were also acquired in Idaho. The principal acquisitions consisted of the small system in Bear Lake Valley, serving Montpelier and Paris, and also the system in Upper Snake River Valley, extending from Idaho Falls to St. Anthony. The system in Bear Lake Valley was approximately 40 miles from the Grace plant. At the time of such acquisition there was no inter-connecting electric line between Grace and the Bear Lake Valley system. The Idaho Falls system was nearly 100 miles from the Grace plant by the usual travelled route. There was no electrical connection between the Grace plant and this Idaho Falls system.

[fol. 201] When the Utah Power & Light Company acquired the properties in Utah, practically all of the important water power sites had been developed within the territory in Utah which the company served, and there were no other sites within its territory in Utah susceptible of development to supply the amounts of power which the market required. It therefore made a very definite plan to construct additional power plants upon the Bear River in Idaho, to meet the growing load in Utah when and as the requirements developed. * * *

Shortly after the formation of the Utah Power & Light Company, and early in 1913, the company commenced a substantial enlargement of the Grace Power plant in Idaho, and the construction of a new power plant at Oneida, Idaho. The Oneida development consists of three large units, and these were brought in in different years as the Utah load required such capacity. In the year 1917, a new power plant was constructed at Cove, immediately below the Grace Power plant. In 1922, additional capacity was installed at the Grace plant, and in 1924 the Soda plant, above Grace was completed and placed in operation. The aggregate installed capacity of the Bear River plants in Idaho when I left the company in 1926 was 95,500 kilowatts.

These plants were connected with the company's system serving customers in Utah by three 130,000 volt circuits extending to a terminal sub-station a few miles west of Salt

Lake City. At terminal sub-station, connection was made to the various 44,000 volt lines constituting the transmission net work in Utah. There is also a direct connection at 130,000 volts from the terminal sub-station to the Utah Copper Company sub-station, at Garfield, Utah, where the Utah Copper Company is served through 130,000 volt circuits extending from terminal to Garfield. This company is a very large consumer of the Utah Power & Light Company. During my time in Utah, they took as high as approximately 37,000 killowatts. * * *

No taps or connections of any kind were made from the 130,000 volt lines for Idaho service.

The plants on the Bear River system have been connected with the company's local systems for local service in Idaho. [fol. 202] Prior to such connection, service was being rendered in Bear Lake Valley to Montpelier, Paris and some small villages. Also, the system in the Upper Snake River Valley, extending from Idaho Falls to St. Anthony, was supplied by power plants located at Idaho Falls to St. Anthony. There were a few small villages such as McCammon and Downey, which were supplied from local plants in those towns. The plants which served these communities from these local systems, were, generally speaking, adequate to the then demands of those communities for service.

Early in 1913, the Utah Power & Light Company commenced the construction of a 44,000 volt line from Grace station to Bear Lake, for the purpose of initially operating dredges used in the construction of the Bear Lake reservoir, and later for operating the company's pumping plant at Bear Lake. Interconnection was made between this line and the system serving Bear Lake Valley. Also, some years later, inter-connection was made between Grace station and the Idaho Falls system, by way of the Portneuf River. This line enabled the connection of the system at McCammon and Downey. Also there were some small villages in the Bear River Valley near the various power plants which were, as time went on, connected.

Q. What was the direction of the flow of power generally over the line connecting the Grace plant with the Idaho Falls system?

A. Excepting during emergency conditions, the flow of power generally was into Grace station from Idaho Falls, rather than out of Grace station toward Idaho Falls.

During the period of my connection with the Utah Power & Light Company, the amount of energy supplied to the company's system in Idaho from the Bear River plants, in Idaho, never in any year exceeded 2 per cent., and was considerably less in many years.

Q. Summarizing your testimony on this subject, for what purpose were the Idaho plants of the Bear River System constructed, operated and maintained, during your service with the Utah Power & Light Company?

A. The purpose of constructing the plants of the Bear [fol. 203] River system in Idaho was solely to serve the Utah consumers of the company. Had it not been for such Utah market, the company would not have built any of the Bear River plants for service in Idaho, because the Bear River power sites were too large for the requirements of its Idaho territory. Of course, after service was available from Bear River plants, the obviously logical thing to do was to inter-connect with the system serving Idaho for the purpose of insuring reliability of service to its Idaho consumers, and for the purpose of making utilization in Utah of surplus energy which at various times might be available from Idaho system plants in excess of Idaho requirements. As I have stated above previously, the total of such service to Idaho system of the Utah Power & Light Company from Bear River system never exceeded 2 per cent of the total energy output of the Bear River System. Over 98 per cent was transmitted to terminal sub-station in Utah for use of Utah consumers. By surplus energy in its Idaho plants, I mean solely those plants at Idaho Falls, St. Anthony, and Ashton, upon the Idaho Falls system, and the plant at Paris, upon the Bear Lake Valley system, which originally served the small isolated systems, and which energy would have been useless without inter-connection.

Q. Will you describe briefly the operation of this Bear River system with respect to the supply of electric energy to supply the demands of Utah customers?

A. In general terms, water power plants are of two kinds: Those upon regulated streams, and those upon unregulated or uncontrolled streams. In general, the power

plants in Utah were upon unregulated streams. Furthermore, in the aggregate their capacity is far less than the requirements of the Utah system. The Utah system consists primarily of a net work of 44,000 volt lines centering about the terminal sub-station to which I have referred previously. The Utah Power plants are connected to this 44,000 volt system and service is rendered to consumers from such system, either directly at 44,000 volts or at lower voltages. Because of the fact that Utah plants are upon unregulated streams, they are operated at constant output at any time, and the immediate demands created by load [fol. 204] changes are met from the Bear River system. Since the 44,000 volt lines of Utah all center about Terminal sub-station and Terminal sub-station is also the terminal point of the 130,000 volt lines from Bear River plants in Idaho, as far as the Bear River system is concerned the practical effect is that of a single consumer located at terminal sub-station, whose demands are instantly met from Bear River plants. These Bear River plants are all located in Idaho excepting Cutler, the lowest one on the stream, which is in Utah. Terminal sub-station does not in fact consume the power which comes over the Bear River system. It is merely the point at which the combined effect of Utah consumers is reflected in their consolidated demand upon the Bear River system. At no time under operating conditions in Utah were the Utah plants adequate to supply the Utah load.

Q. What are the functions of the so-called Dispatcher at terminal with respect to the transfer of power from the plants, and in particular, the Bear River plants, to the consumer or consumers?

A. To be ready for consumers' demands, the Dispatcher can see and insure that there are sufficient machines rotating to meet the probable demand at any time. His duty also is to see that the speed of the system is correct, namely, at 60 cycles per second; also that the voltage is correct for delivery to consumers. At the moment, however, of the incidence of load, he has no control whatsoever. The process of transference of energy from generating stations to the consumers, occurs automatically and instantaneously, and he can in no way control that at the moment of its occurrence other than open the switch and to direct the cut-off of all

service to the consumer. After the load change has occurred, the Dispatcher again insures that the system is operating at frequency and voltage, and he may desire to transfer load from one station to another, but he cannot change the total amount of load. It is entirely beyond his power to do so other than to completely interrupt service to one or more consumers. The Dispatcher transfers load from one station to another through the medium of so-called automatic governors which control the turbine gates; he simultaneously [fol. 205] closes the gates of one turbine and opens those of another, i. e., he directs the station operators. The thing occurs automatically and instantaneously.

Q. I do not want to imply an answer that is incorrect, but in order to see whether I understand you correctly, I ask whether this is an illustration: If, in fact, this combined demand or aggregate of all consumers' demands was being reflected upon both the Oneida station and the Grace station at the same time, and in fact the Grace station was of capacity sufficient under its conditions of installed capacity and water existing at the time to carry the entire load, the Dispatcher could notify the Oneida operator to close his gates, and then the load would be automatically transferred to Grace; is that the thought?

A. That is true after the change in load has occurred, but at the moment of incidence of load, he has no control whatsoever; the machines automatically supply the power needed instantaneously. It is this: As if all the generators were one generator. This matter of load between generating stations and between units is incidental. They act together as a generator supplying the demand, and that occurs instantaneously.

Neither the step-up transformers at the station or the step-down transformers at terminal affect or interrupt the continuous flow of power. Transformers are devices used for the purpose of changing the voltage and permitting economic transmission of power and energy. They are not inherently necessary. Their use is one of economic convenience. In an electrical system, the interposition of transformers makes two or more complete circuits for the flow of current. These various circuits are rigidly interlinked at transformers with magnetic fields so that while the current circulates in various individual circuits, the flow of

power is continuous, direct and immediate. A mechanical analogy might be that of transmission through belts and pulleys. We might transmit power from a water-wheel to a point of use solely by one belt which would constitute the comparison of the transmission without transformers, or we might, for practical convenience, interpose one or more countershafts with pulleys of different sizes, and using two [fol. 206] or more belts, to accomplish the transmission between the water-wheel and the point of use. In this case the belts do not touch each other, just as the electrical system with transformers contains several paths for the flow of current, but the flow of power between the water-wheel and the point of use is instantaneous, unbroken, and direct, whether we use a single belt or a series of belts. A transformer may be likened to the gearing of an automobile. The shaft is discontinuous at the gearing but the flow of power is constant and uninterrupted. * * *

The ordinary unit of measurement of electrical current is the ampere. The common unit for the measurement of power is the kilowatt, which is the product of current and electrical pressure or voltage. The kilowatt hour is the commonly used unit for the measurement of electrical energy. It is the product of the kilowatt multiplied by the time in hours during which the power acts.

The consumer gets and uses, speaking in electrical terms, power not current.

Cross-examination.

By Mr. Barber:

The consumer gets, in practical effect at least, the amount of energy that will do a certain amount of work. In common commercial uses, we use the kilowatt hour as the unit of measurement which is power applied through a unit of time. He could take two hours to get a kilowatt hour of energy, or he may get a great many in a moment, depending on his load.

Additional capacity installed in plants means the installation of additional generators and at the Grace station that means an additional pipe line and all the other facilities that go with it for getting more water there. Each of these stations have more than one generator. The output of the various generators in the stations are gathered

together at the station bus. It may or may not consolidate there and go out over the wires as a single current. That is not essential to the process. Whether the various transmission circuits are all tied together or not is not material to the transmission of power. There may be more than [fol. 207] one transmission line and they may not be tied together at the generating end. That is not material to the process. They usually take their power from the station bus really rather than from different generators, although in modern operation we frequently connect through from large generators directly through the transmission line, but that again is a matter merely of mechanics of the process.

Steam power can be used in place of water power for the generation of electricity. The question of choice between them is merely a matter of economic factors that would enter into a particular situation.

There is a greater amount of electrical energy available for mechanical work or other purposes at the station than at any distance therefrom, the difference being the consumption of energy in the system itself in keeping it live and active.

Q. And while not proportional to the length of the system it will increase with the length of the transmission and distribution lines?

A. No, that is not true. That is a question of economic design. Length of transmission does not necessarily mean geater losses or greater system uses. That is a matter of the economics of each problem and the way in which the engineer meets the problem.

Q. But in practical operations that is true, is it not?

A. Generally not. The system uses pile up more rapidly, depending upon the extent to which the energy is distributed, as between a few customers or many. Broadly speaking, one of the system uses which figures rather prominently is the charging of transformers. If service is being rendered to many residential consumers, these small transformers which are spread all over town have considerably greater requirement for energy to keep them charged than if it were one consumer and one transformer. I do not mean to grow technical, but the distance, in a practical transmission system, is not necessarily the controlling factor in these system uses. * * * It is one of the factors.

We do have line losses so-called. They generally will vary and increase with the greater length of line. For the same size of wire and the same voltage. For greater distance the engineer proceeds to use higher voltage so as not [fol. 208] to increase those system uses or losses. He is not able to wholly control that factor, but is limited by economic factors to the size of the conductor he would use.

Q. Your connections with transmission lines in Idaho and distribution net-works is such that you can supply electrical energy to any users upon that net-work within the territory served by your physical connections that you may desire?

A. Yes. After service was available from Bear River, the company wanted to give exactly the same degree of reliability to Idaho consumers as Utah; and these connections permit of rendering emergency service whenever required. We could serve territory around St. Anthony with electrical energy generated at the Oneida station, for instance, if we so chose to operate the system. That would only happen though in case the Ashton, St. Anthony and Idaho Falls plants were shut down. That is, in case no power were available within that Upper Snake River Valley system. But we could cut those plants out if we chose. If they were all shut down, then the power would flow from Bear River up there. The direction of the flow of power and energy is not at the moment within any human control on the power system itself. It depends upon the consumer. He makes it flow to where he wants it.

Q. But as between different localities, for instance, each one of which we will say has such devices which may be physically connected to a line and operated in connection therewith, you direct or route your current to one or the other by the construction and use of the transmission line?

A. No, you cannot do that. You can merely provide the path for the flow of power, but as an operator of a power company, I could not force a kilowatt hour on any consumer anywhere or on any group of consumers unless they first put themselves in a position to demand it. I could not direct it.

Q. I am assuming that the demand is made, and aside from the question of demand by the consumer, which I fully admit the necessity of, you build your line to one point [fol. 209] or the other?

A. Yes. * * * And with installed capacity at any particular plant, we can construct a line from there to any community within a practical economic range, and with physical connections made at that community, there being a demand upon the part of the consumer, we can then serve that community. In other words, the construction of a station at a particular point does not itself determine the points into which electrical power may be taken from that station the next year or the year following.

Q. As a further illustration, you spoke of the delivery of power to the Utah Copper Company over high voltage lines and with a heavy load factor. As I understand it, the Utah Copper Company has its own net-work of distribution lines extending over a territory covering its operations?

A. The Utah Copper Company is supplied, as I stated, by 130,000 volt lines extending from terminal to the sub-station of the Utah Copper Company at Magna, in the Garfield area. From the Magna sub-station, the Utah Copper Company has lines running to its Magna mill, its Arthur mill, and to the mine in Bingham Canyon.

Q. And upon its net-work, the Utah Copper Company chooses its point of use perhaps from one point to another or varying between days?

A. If you mean that they have it in their control to say what motors they shall operate at any time, and where they are, yes. Perhaps at one near point or perhaps at a point miles distant. And they may also, choosing between different devices, generally speaking, control the character of use to which they put it. Over all these things the Power Company has no control.

It merely delivers to their connection at Magna the amount of energy demanded by the consumer, which represents the composite demand of the Copper Company's uses and a great many Copper Company's devices.

Q. You spoke of the Dispatcher having no control whatsoever over a choice as between one plant and another and as to which should deliver the energy demanded by the load upon the transmission line at the moment of incidence of an increased load?

[fol. 210] A. Yes, that is correct.

Q. However, the Dispatcher directs the attendants or operators of the different stations to put one plant in readiness or two, or different ones as he chooses, and in that

manner does control the station which will deliver that electrical energy at the time the increased demand is exerted upon the system?

A. The question is one of point of time. The Dispatcher does make an estimate of the load which he expects to come on in the near future. That is the total aggregate load; and he does determine what machines shall be ready to take that load when it occurs. But at the moment, at the instant the load occurs, he has no part whatever in the action. It occurs instantaneously, automatically; the consumer requiring an amount of energy which is instantly supplied by the machines running ready to supply it when the consumer demands it, and at that instant the Dispatcher has no control whatever unless he wants to completely interrupt the consumer by opening a switch. That is the only control he has.

Q. Do you know the comparative cost of generating your power by steam plants in Utah at that time as compared with construction of these hydro-electric plants and the additional transmission line required to get that to Utah consumers?

A. I have no data of that with me, and I cannot tell you figures and calculations made. After all, that is a theoretical rather than an actual calculation, because of the fact that that is a hydro system, but our researches and our studies satisfied ourselves as to the program that we carried out in its economic wisdom.

Q. Considering the physical features of the country and place where water could be found and the point to which it could be taken, it would have been possible for you to simply have flumed or conducted all the water down to a station terminal and generated your power there?

A. Well, as a physical matter, knowing that country very thoroughly, I would say it is possible, but it is certainly not practical. It would not have been economically practical to have diverted it, to transfer its energy from the points in Idaho at which the fall could be utilized, by [fol. 211] any such mechanical means as moving belts and pulleys. It would have been possible but not practicable. That is the reason for electrical transmission.

Redirect examination.

By Mr. MacLane:

Q. A question was asked on cross-examination as to whether power from the station went out as current over the lines. Are power and current synonymous?

A. No, not at all. Current is one element of deriving power, but they are not synonymous.

Q. What is meant by the station bus?

A. The station bus, or more strictly the station bus bars are the electrical conductors within the station, so arranged that generators may be connected to them or disconnected from them, and also so arranged as to permit the connection or disconnection of outgoing lines. There is no interruption of either the flow of current or of power at the bus except complete interruption by throwing the switch and completely disrupting the circuit. The bus is not the point of origin of the power which is delivered to the consumer. It is merely one part of the path for the transmission of power from the generator to the consumer. The point of origin of the power as electrical power which is delivered to the consumer is in the generator; as mechanical energy it is in the falling water.

[fol. 212] J. A. Hale, a witness on behalf of the plaintiff, testified:

Direct examination.

By Mr. Corey:

J. A. Hale, Salt Lake City, Utah, Chief Engineer of the Utah Power & Light Company. I received my degree in civil engineering from the Virginia Polytechnic Institute in 1911. I have been connected with the Utah Power & Light Company for the past eighteen years. Except during about a year of the World War I have been employed at either doing construction work for the company or directly by the company. I have occupied the position of chief engineer since the early part of 1926. As such I have charge

of the operation and maintenance of the company's interconnected generating and transmission system.

I have here a diagrammatic map, not exactly to scale, which shows in general the territory served by the Utah Power & Light Company, the generating stations, and transmission line. The high voltage line of 130,000 volts is shown by the heavy line. The medium and low voltage lines are shown by lighter line-. The generating stations of the company are designated by hollow squares, and the name of the plant is shown against the squares.

(Plaintiff's Exhibit "C" admitted in evidence, and is as follows:)

PLAINTIFF'S EXHIBIT "C"

(Here follows exhibit, side folio 213.)

[fol. 214] The company owns and operates an inter-connected, inter-state, alternating current, three phase, 60 cycle electric power system, consisting of generating stations, transmission and distribution lines, and other electrical facilities, located in Idaho, Utah and Wyoming, (extended to Wyoming in the early part of 1929,) by which energy in the electrical form is generated, transmitted and distributed in southeastern Idaho, northern and central Utah, and southwest Wyoming, and between those states. That part of the inter-connected system that is located in Utah and Wyoming, which I have called the "Utah Section," consists of medium voltage, that is 44,000—11,000 volts, transmission line, connecting some twenty hydro-electric and steam generating stations, having a combined installed capacity of 116,000 kilowatts, and medium and low voltage, that is 44,000—110 volts, transmission and distribution line, by which electric energy is distributed and used within said states. That part of the inter-connected system located in Idaho, with lines extending into Utah, which I shall hereafter refer to as the "Idaho Section," consists of:

First, medium voltage, that is 44,000—110 volts, transmission lines connecting the following generating stations:

Ashton, Fremont County, Installed capacity	5,800 kilowatts
St. Anthony, Fremont County, Installed capacity	500 kilowatts
Idaho Falls, Bonneville Co., Installed capacity	1,875 kilowatts
Paris, Bear Lake Co., Installed capacity	650 kilowatts
High Creek, Franklin Co., Installed capacity	550 kilowatts
Total installed capacity	9,375 kilowatts

and medium and low voltage transmission and distribution lines extending therefrom, whereby electric energy is generated, transmitted and distributed for use within the State of Idaho. This part of the system, the "Idaho Section," is of sufficient capacity to, and normally does, generate and distribute practically all the electrical energy required to serve the company's customers in said state. For example, during 1930 these stations generated 33,285,000 kilowatt hours, whereas the total sales, losses and station uses pertaining to Idaho business in Idaho was approximately 28,343,000 kilowatt hours. These lines are also connected with

[fol. 215] the interconnected system of the Idaho Power Company at Pocatello, and Blackfoot, Idaho, and by means of such interconnection electric energy may be transmitted in either direction as the demands of either system may require, thus affording assurance of continuity of service on both systems.

Second, what is known as the "Bear River System" consisting of two 130,000 volt transmission lines, carrying three circuits, known as the "Grace-Terminal" lines, extending from the Grace Generating Station, with an extension to the Soda generating station, in Idaho to a receiving and switching station named "Terminal" in Utah, two 44,000 volt transmission lines from the Grace station to a point of contact with similar lines in Utah, and the following generating stations on Bear River in Idaho, likewise connected to the Grace Terminal lines.

Soda, Caribou County	14,000 kilowatts
Grace, Bannock County	44,000 kilowatts
Cove, Bannock County	7,500 kilowatts
Oneida, Franklin County	30,000 kilowatts
Total installed capacity	95,500 kilowatts

In addition to these stations there is a 30,000 kilowatt station on the Bear River in Utah, known as the "Cutler" station operated in connection with the "Wheelon" switching station, which I shall mention hereafter, and connected with the 130,000 volt transmission line to Terminal station. While this Cutler station is operated in parallel with the Bear River system, I do not include it as part of the Idaho section, but as part of the Utah section as previously described, on that part of the inter-connected system located in Idaho.

Q. You have distinguished between the Bear River system, and the medium and low voltage systems, do you know for what purpose the Bear River system was constructed and is now primarily used?

A. It was constructed solely, and it is now used primarily, for serving the company's customers located in Utah.

After supplying station uses, more than 98 per cent of the electrical energy generated at these stations is transmitted directly over the Grace-Terminal line, and 44,000 volt lines,

[fol. 216] and used for supplying customers of the company in Utah, and transmitted through Utah for Wyoming uses. The remaining two per cent or less of electrical energy generated at these stations is distributed and used as follows:

First. An insignificant portion is distributed at low voltage from each of said stations to small neighboring communities.

Second. The 44,000 volt lines are tapped enroute to Utah for local Idaho uses at a single sub-station at Preston, Idaho.

Third. The Grace station is connected with the medium voltage transmission lines of the Idaho section, which I have previously described.

I have prepared an exhibit showing for the calendar year 1926 and for each succeeding year thereafter to and including the first eight months of 1931, the operating data of the Idaho stations of the company with respect to their output in kilowatt hours, and the disposal of energy as between company uses, deliveries to Idaho customers, and deliveries to Utah. For the year 1930 the first column of the table shows total energy generated at all of the Idaho stations as 233,253,000 kilowatt hours. The second column shows the total energy generated at Idaho stations other than Bear River stations, 33,285,000 kilowatt hours. The third column shows the total energy generated at Bear River stations in Idaho as 199,968,000 kilowatt hours. The fourth column shows total station use at Idaho station- including Lifton and line use due to Lifton load, as 6,978,000 kilowatt hours. The fifth column shows total energy delivered to Idaho consumers including company use at division offices, 24,046,000 kilowatt hours. The sixth column shows total energy from company Idaho stations for transmission to Utah 198,502,000 kilowatt hours. The seventh column shows measured output of Bear River stations in Idaho to 130,000 volt transmission lines, 161,649,000 kilowatt hours.

By agreement exhibit was copied into and made part of the record and is as follows:

EXHIBIT IN EVIDENCE

[fol. 217] Utah Power & Light Co., Salt Lake City, Utah

September 25, 1931.

Year	Total energy generated at all Idaho stations M-Kwh.	Total energy generated at Idaho stations other than Bear River stations M-Kwh.	Total energy generated at Bear River stations in Idaho M-Kwh.	Total station use at Idaho stations including Lifton and line use due to Lifton load M-Kwh.	Total energy delivered to Idaho consumers including company use at Division Offices, etc. M-Kwh.	Total energy from company's Idaho stations for transmission to Utah M-Kwh.	Measured output of Bear River stations in Idaho to 130,000 volt lines M-Kwh.
1926	416,875	45,823	371,052	10,998	17,284	385,914	316,192
1927	308,476	43,259	265,217	7,727	17,226	280,853	222,302
1928	265,042	41,051	223,991	7,649	18,896	235,568	179,294
1929	244,629	36,099	208,530	5,453	20,281	215,752	173,268
1930	233,253	33,285	199,968	6,978	24,046	198,502	161,649
1931 (8 Mo.)	160,103	19,258	140,845	7,575	16,294	133,708	115,145

NOTE: M-Kwh means thousand kilowatt hours. For instance the first figure given in the table is 416,875,000 kilowatt hours and so on for all the figures given.

Q. What is the relation as shown by the table of kilowatt hours generated at Idaho stations other than Bear River stations, that is column 2 to the kilowatt hours delivered to Idaho consumers, that is column 5?

A. It shows that the kilowatt hours generated are more than sufficient to supply the Idaho consumers' uses and includes station uses at Idaho stations for running auxiliary apparatus, such as pumps, ventilator fans, supplying light to operators' cottages, and uses of that kind and for operating the pump at the Lifton Pumping station, which is the pumping station located at Bear Lake, whereby the water is pumped from the lake into the river. This water is later used for irrigation purposes, down along Bear River. Column 6 shows that the total energy generated by all of the company's Idaho stations which is available for use in Utah, that is, Idaho sales, and Idaho station uses, taken out [fol. 218] of the total. It includes the kilowatt hours shown in column 7. That is to say, it includes both the 44,000 volts and 130,000 volts transmission and all that energy is transmitted to Utah, except for the usual line losses. We have at the Bear River stations meters which measure the output to the 130,000 circuit. The last column shows definitely and accurately what that output is. That energy actually goes to Utah, and there are no taps to the 130,000 volt lines in Idaho for service in that state. The figures in the various columns in the exhibit show as to years other than 1930 generally the same condition as existed in 1930 relative to the disposal of energy generated, and show accurately the amount of electric energy delivered at the station for transmission to Utah.

Meters placed in the several generating stations show the so-called station output in kilowatt hours. The amount of electrical power or energy delivered to consumers is measured by meters at the consumer's point of use. We can and do measure at the generating station the amount of energy generated, and frequently measure the output to the transmission lines, which leaves from the station. The demand of the various consumers for power is expressed in these measurements in the aggregate, but the net amount delivered to any consumer, and the amount on which he is billed, for which he pays, can only be determined by

measurements at the consumer's point of use, because of intervening system uses or losses.

There is no practical commercial way, in such interconnected systems as that of the Utah Power & Light Company, by which energy generated at its Idaho stations for barter, sale and exchange, can be measured, because the energy generated at the Bear River stations goes over the interconnected net-work of transmission lines in Utah, and loses its identity with the energy generated in the Utah section, so that the consumers' meters in Utah register the energy received by the consumers without reference to its source. It may be assumed for general statistical purposes that the same percentage of power generated in the Bear River system is actually delivered to the consumer as it is generated in the system as a whole, but the result of course is simply [fol. 219] a computation and not a measurement. If we had a single generating station and a single consumer, the amount generated and delivered to the consumer could, of course, be determined accurately, but such determination can be arrived at only by computation, and then only approximately upon an inter-connected system. . . .

Q. What do you mean by the generation of electrical energy?

A. I mean that part of the process of transfer of energy from its source in nature to its point of use, which is accomplished by the so-called generating unit, this consisting of a water wheel, or steam turbine, a generator and auxiliary apparatus.

Q. Describe specifically the generation and transmission to Utah of electrical energy by the Bear River system.

A. Water is collected and diverted from the channel of the Bear River at each plant by means of a dam, and an artificial conduit where it can be controlled readily under head or pressure. This conduit leads to a turbine, through a valve or gate by which the entry of the water into the turbine is regulated. The turbine is connected by a shaft directly to the electric generator. The turbine valve is operated by a governor, which in turn is controlled by the load demand upon the generator. Attached to the turbine shaft is a rotor, the rotating element of the generator, which rotates within the stator, the stationary part of the generator. Wires lead from the stator through a switch to a set

of common wires called the station bus. This bus is connected by wires through a switch to a transformer where the voltage is raised or "stepped up" to the desired voltage of transmission. The transformer is connected to the transmission line.

When there is no load demand by customers for service, the turbine valve is opened only sufficiently to permit the entry of sufficient water in the turbine to hold the equipment under constant rotation and electric charge in instant readiness to serve, and no energy is generated beyond that required for this purpose. The balance of the available water is held back, or allowed to pass around the turbine into the channel of the stream. Immediately when electric energy is demanded by customers, this demand asserts itself at the [fol. 220] generator causes a slight retardation of the rotating part, causing the governor to so open the turbine valve as to permit the required additional water to flow through the turbine. By this means, the energy of the falling water is instantaneously transferred through the turbine shaft to the generator, which it leaves in the form of electrical energy passing through the station bus and the transformer and over the transmission lines to the point of use.

After the water passes through the turbine it is used for irrigation at points lower down the river. The generators operate at 2300 or 6600 volts and 60 cycles. The generation at some such relatively low voltage is economically necessary because of the difficulty and expense of properly insulating, within the narrow spaces of the generator, for generation at transmission voltage.

The voltage of generation continues to the "step up" transformers, which raise the voltage from the voltage of generation to approximately 130,000 volts, at which voltage the electrical energy is transmitted over the Grace-Terminal lines to Terminal station in Utah, and to 44,000 volts for like transmission to point of contact with 44,000 volt lines near Logan, Utah. Electric energy generated at Grace, Cove, Oneida and Soda stations is transmitted directly over the Grace-Terminal lines to Utah. No taps or connections are made on these lines for service in Idaho. There is a switching station at Wheelon, in Utah, at which point electric energy is also received over a like 130,000 volt line, connected to the Idaho Power Company's generating station

at American Falls, Idaho. Two 130,000 volt lines extend from the Grace-Terminal lines, at Terminal, to the Utah Copper Company at Magna, Utah. That company takes the electric energy direct at that voltage. Except for this use, all electric energy brought to Terminal over these Grace-Terminal lines is there stepped down to medium voltage, transferred to a medium voltage bus, and made available over medium voltage lines extending to the communities and load area of the Utah section, and co-mingling on these medium voltage lines with electric energy generated at the company's station located in the Utah section.

[fol. 221] Q. Can you illustrate by the actual operation of some part of the system the process whereby the use of electric energy is supplied to a customer in Utah through the Bear River system?

A. A description of the process whereby electric energy by the Utah Copper Company is supplied will illustrate this very clearly. Tap lines from the Grace-Terminal line, at Terminal, extend directly to the Copper Company at Magna, Utah, where the Copper Company steps down the voltage from 130,000 volts to medium or low voltages, at which it distributes and uses such electrical energy over lines owned and operated by it. At any time electrical energy is required by the Copper Company at any point on its lines, an employe of the Copper Company simply closes a switch, thereby completing the electrical circuit which operates the electrical equipment desired to be used. For example, if this equipment be a motor, the motor immediately starts to rotate, thus requiring the generators on the Bear River system to carry more load, this additional load being picked up by the generators.

The above is illustrative of the method by which the electrical requirements of the company's other customers in Utah are satisfied.

The company has about 80,000 customers in Utah. These customers are served under contract with the company.

The voltage at which these customers are served ranges from 110 volts to 44,000 volts. Power demands of these various customers vary from a fraction of a kilowatt to several thousand kilowatts, or more.

Q. Explain how these customers' uses and demands for electrical energy impress themselves upon the inter-connected system of the company.

A. Electric energy is taken by these customers, and each of them, if, as and when they choose, by their merely closing a switch or pushing a button. This electric energy is not and cannot be practically furnished from a storage battery, but is instantly transferred from a generator.

It is not possible to store electric energy on our system.

The Utah section consists of a net-work of 44,000 and 11,000 volt transmission lines, plants and distribution sys-
[fol. 222] tems in Utah, which are ultimately connected at Terminal. Except for a steam generating plant located at Salt Lake City, these plants are isolated plants, located on streams, the flow of which is not regulated by storage, and there is virtually no storage of water in the diverting works of the plants themselves; consequently these plants operate as run of steam plants, at the effective capacity furnished by the available water, being generally near centers of load in Utah, and while it is impossible to definitely distinguish the destination of any particular power, yet usually their output is absorbed by consuming devices in Utah in this interconnected system. In the aggregate, the capacity of these plants is insufficient to satisfy the demands, the load demands, of the Utah customers. As previously stated, the Terminal sub-station is the central point of the interconnected Utah net-work. The aggregate residual demands from the Utah interconnected system, after applying to their satisfaction the output of the Utah plants, impresses itself on the Bear River plant by way of Terminal sub-station which is not in any sense a consumer of electric energy, except in the sense that any substation is a consumer of electric energy for operation of transformers, lighting and use by auxiliary equipment.

The functions of the Chief Dispatcher, who is directly in charge of the service, are primarily, to forecast by a study of the load charts the demands to be made at any time by the consumers on the system, and to see that generators and transmission lines are kept in readiness to meet the demand, and to designate from time to time which stations and which lines shall carry the load, in such a way as to insure service on the one hand and avoid waste on the other.

Q. Can your dispatcher switch power to the consumer and to the power lines?

A. No. His function is really the reverse. The company, or no employe of the company, can in any way control the

customer's demand, except of course by opening switches and refusing to give service, nor can the company nor any [fol. 223] employe of the company switch to any particular customer the output of any particular station. What the dispatcher does first is to see that sufficient generators of sufficient capacity are rotating on the line available to satisfy all the demands of the consumers coming on the line. This consumers' demand impresses itself on the generators instantly, and is met instantly without any sort of company control. After the demand has asserted itself, however, the dispatcher may direct that any particular station or any particular generator which is not required to be kept in operation to meet the aggregate demand, may be closed down, or any other generators may be placed in service to take all or part of the load from generators previously in service, but the dispatcher has no control whatever over the aggregate demand or load.

Q. How is the electric energy required for service to the Idaho section of the company's interconnected system delivered?

A. In the same manner as I have described for the Utah section, that is, the demands of customers on medium and low voltage lines in Idaho impress themselves on the adjacent local generating stations. If the demands are not fully satisfied from these stations, that part which is not so satisfied may impress itself upon the generator at the Grace station through the interconnection, but as I have previously stated, there is normally in the aggregate an excess of capacity in the local Idaho station over the Idaho demand, and the actual demand on the Bear River stations for Idaho service is negligible.

[fol. 224] Mr. Corey: We desire to offer a few questions and answers with respect to the application of Section 5 of the Tax Act, which are not strictly within the order of reference to the Master. We ask that counsel for the State may permit this, with the same effect as though the testimony were offered directly to the statutory court, but subject, of course, to all objections which might be made if the testimony were so offered.

Mr. Barber: That is agreeable.

Mr. Corey: And we desire to ask that the testimony heretofore offered in the form of the Lukens' affidavit be

similarly considered and the objections as stated by counsel be deemed as though made in the presence of the statutory court.

Mr. Barber: That may be.

Q. I will ask you, Mr. Hale, if the company furnishes electric energy for pumping water for irrigation purposes in Idaho?

Mr. Barber: I object to that as irrelevant, immaterial and incompetent, and not pertinent to any issue now in this case, under the decision of the court.

A. Yes.

Q. How many such customers does it have?

Mr. Barber: May it be understood that our objection goes to all of this, in order to save time?

Mr. Corey: Yes.

A. 56.

Q. At how many points is such electric energy used and measured?

A. 68.

Q. For the calendar year 1930, what was the consumption of electric energy for these customers?

A. 6,838,000 kilowatt hours, measured by watt hour meters, located near points of use at the end of the tap line furnishing the service, usually a good many miles from the [fol. 225] generating station. These measurements represent the electric energy actually used which forms the basis of the customers' billing. They do not show or represent the number of kilowatt hours generated at the place of production or the generating station because of the transmission, distribution and transformer use, or so-called loss, incident to all electric transmission and distribution lines, which in some cases will amount to as much as 20% of the electric energy generated, but will vary as to each place of use, according to distance, size of conductor, kind of line, and other variables. It is practically impossible to accurately determine the exact loss between the place of production, or the generating station and each point where such electric energy is actually used. Some of the water pumped for irrigation in Idaho is used for irrigation of land in Utah. I do not know the acres so irrigated, nor the

amount of electric energy delivered to pump water for irrigation of land within the State of Utah. No such information is available from any measurements or records in possession of the company because the water is pumped in Idaho by a single consumer through a single pump, and some of the water is used for irrigating land in Idaho, and some is used for irrigating land in Utah.

Mr. Corey: That ends the examination on that particular question, Mr. Barber.

Q. What would you say as to the present and future operations of the company with respect to the matters which we have discussed in your testimony; that is to say, as to the generation and disposal of energy on the Bear River system, and the methods of operation and relation between the different parts of the system?

A. The present operations are as I have described. The Bear River system is being used primarily to satisfy Utah consumers. The local use from the system in Idaho is no greater than it has been. So far as the future is concerned, I have no reason to anticipate any change.

[fol. 226] Q. Assume a load of 1 kilowatt on a Bear River station in Idaho, in response to a demand of a Utah consumer. Is it possible to measure the kilowatt hour on that load at the generator until it has been consumed or used by the consumer in Utah?

A. No, because the generation and use is simultaneous and the problem is not different in principle with respect to the aggregate load on the Idaho Bear River generators, and the aggregate consumption in Utah. The aggregate power generated in Idaho must be simultaneously consumed in Utah, and the measurements cannot take place at the generator, or any other place on the system, except as the power is being simultaneously used. The energy is passing over the state line between Idaho and Utah at the time the measurement takes place. The number of kilowatt hours generated on the Bear River system's plant in Idaho for the months of June, July and August 1931 is

June	23,557,000	kilowatt hours
July	34,564,000	" "
August	32,262,000	" "

and the number of kilowatt hours used for station uses on the plants of that system, including also the Lifton Pumping Plant is

June	1,081,000	kilowatt hours
July	1,880,000	" "
August	1,565,000	" "

The number of kilowatt hours delivered by these plants to the transmission lines for Utah use is

June	22,443,000	kilowatt hours
July	32,649,000	" "
August	30,663,000	" "

It is not possible from any meter which the company has, or which it could install at the generating stations or so-called place of production, to record or determine the actual number of such kilowatt hours generated for barter, sale or exchange.

[fol. 227] Cross-examination.

By Mr. Barber:

When I spoke of generation as being a part of the process of transferring energy, I did not ignore the fact that there is also in the process of generation a transformation or conversion of the mechanical energy in the turbine shaft into a different form of energy, that is, electrical energy.

It must be converted into electrical energy before it can be transmitted and before it can be used for lights, motors and other devices for which we now use electrical energy.

This process of transformation is complete at the generator, and you have a greater amount of energy there, capable of doing a greater amount of mechanical work, at the generator than you do after transmitting it into Utah.

I do not know just what happens inside the generator. The operation of the generator and that of the transformer is somewhat similar.

You have no physical contact between the two parts in either, but you have a magnetic field of force in one, cut by the moving conductors—that is in the generator.

While in the transformer, this magnetic field cuts the wires of the secondary circuit.

We can transmit 2300 volts or 6600 volts current for some distance, but it would be impossible to transmit that over the system we now use—that is, over the wires or the conductors—and get any appreciable part of that energy down to consumers in Utah.

This 6600 volt or 2300 volt current generated at the station could be utilized by a consuming device without transformation, if that device were so constructed as to be adapted to such voltage, but if that same device were connected with the 130,000 volt current on the other side of the transformer, it would not operate.

A kilowatt hour is the ordinary unit of measure of electrical energy and an amount of energy that will accomplish [fol. 228] a certain amount of mechanical work and an amount that may be delivered over the course of two hours or in the course of a second or two.

The response of the generator to an increased load or demand upon the wires is made possible by the use of certain controlling devices which cause the turbine gates to admit a greater amount of water to the turbine wheel.

We have local markets in Idaho, around Ashton, St. Anthony, and Idaho Falls and the Paris Creek station.

We have a generating plant near Shelley. At the present time it is not operating. We are able to use it if we need the output of its generators.

Q. Do you know when the Ashton plant was installed, approximately?

A. It was rebuilt approximately in 1925 or 1926.

The St. Anthony plant was built in 1914.

I do not know the comparative market which the operator of the St. Anthony plant had in 1914, as compared with today. Generally, I think there is not so very much difference.

Presumably it has increased since 1914, naturally, I would assume that it has increased, of course, it is a matter of speculation as to how much power we will be able to market there in the future.

Q. Your system is so inter-connected, however, that if an increased market should occur, or be developed there, you would be able to supply that with power generated at other stations than at the St. Anthony station, if you chose?

A. If it was necessary, yes—with the connections which

we could make with energy generated by the stations on the Bear River system, but I think it would take a very unusual growth to necessitate that connection.

Some of the Bear River stations have one, some two, some three and one five generators. Normally the output of all the generators that are operating at a single station is conducted through a common bus.

[fol. 229] At some point between the generators and the bus, or immediately adjacent to the bus, is the first point at which the output of the generator can be measured.

Meters placed immediately adjacent to the transformer, on the wires coming from the generator, will measure a greater amount of electrical energy than meters placed upon the secondary side of the line going out to consumers, the difference being the use of the transformer itself. This use accomplishes no purpose except to enable the transformer to function.

The percentage of loss at the transformer is very small; probably less than one per cent, or thereabouts.

By "line uses" I mean that part of the energy which is used in the normal functioning of the line. I don't know exactly how it is used, but probably in creating magnetic fields, or something of that order, or overcoming the resistance of the line, or overcoming the reaction of the line.

There may be some leakages, in the line too, but they are very small. The amount of leakages depends upon the efficiency of the maintenance of the line to some degree. If the loss is excessive, the line refuses to function. I believe it might also depend upon weather to some small degree.

Q. About how much power, if you know, do you receive a year from the Idaho Power Company?

Mr. Corey: We object to that as irrelevant and immaterial. That is assuming that he knows. I don't know that he knows.

A. I don't know. I have not the figure here, Mr. Barber. It is a substantial amount.

Q. And at the point where it is delivered to you, is that metered or measured?

Mr. Corey: Is it understood that my objection goes to all of these questions along the same line?

[fol. 230] Mr. Barber: Surely.

A. Yes.

Q. And do you pay the Idaho Power Company for energy received at that point, on the basis of that meter measurement?

A. Well, I think so.

Our transmission net-work is so connected with the Idaho Power Company line that is is possible to deliver electrical energy generated at our stations to the Idaho Power Company for its customers.

Speaking of the inability of a dispatcher to control the output as between different stations, I meant that by his directing employes of the company, he can provide that the demand then being exerted upon the system be supplied by one station or another, provided, of course, that the capacity of that station is sufficient.

We meter the energy or power delivered to the Utah Copper Company at a point where our lines contact its line and we bill them upon the basis of that measurement.

We do not know at any time on what part of their system they are using that energy, nor is it necessary to the operations of our generating plants, or transmission lines that we do know. They may use it at the point of delivery, or some distant point on their lines, or they may use it in one device such as a motor, or in other devices such as lamps and this choice of use on their part makes no difference in the operation and conduct of our system, except, of course, as the amount of demand would vary.

All of our plants in Idaho are hydro-electric plants. Besides Shelley we have installed but not operating and not included in the tabulation a small plant at Georgetown.

Q. You could generate electrical energy at those stations, with different machinery, of course, by using the power from burning fuel instead of the power from falling water?

A. Different stations then.

[fol. 231] Q. You would have to reconstruct the station, I suppose?

A. Yes, sir. • • •

Q. Or in lieu of using those stations in Idaho, and the transmission lines of Utah, so far as power sold in Utah is concerned, you can generate that at a Utah station, constructed for that purpose, utilizing the power from burning fuel instead of the power from falling water?

A. We could.

Q. By so doing, you would save the so-called losses in transmission lines from distant points in Idaho to that point?

A. Yes. They would no longer exist.

Q. And you would save the cost of maintenance and construction of the transmission lines?

A. Well, I would say that we would not be at that expense at any rate—that is true, as far as future lines might be concerned.

Q. The cost of a transmission line, such as carries that 130,000 volt current from the Bear River system to the Utah line, is very heavy?

A. It varies, of course, with the type of line, but I would say beween five and ten thousand dollars per mile, and in addition, we have a maintenance cost in keeping that in an efficient state of use.

I am not familiar in detail with the power rights which the company has, under which it uses the water flowing in the streams of Idaho at these various stations.

The state rights are held under a permit and license from the State of Idaho.

I think we have state rights in connection with all the plants on the Bear River system.

Q. You are able to measure transmission losses accurately, if you install meters at such points as needed?

A. There is no way of measuring a loss at any one point. [fol. 232] A loss can only be measured or derived by measurements at different points.

Q. You do measure now the output of each of your big stations on the Bear River system, and with meters installed at the end of their transmission lines, at Terminal stations, or if you chose, on the line, you can measure the amount of energy delivered by them to that station, and similarly, you can accurately measure the amount of energy delivered to Terminal station?

A. Yes.

Q. Isn't it a fact that you could install meters there on the line and exactly measure it?

A. Yes. We, of course, can put meters on all in-coming lines, and measure what comes in.

Q. From that point on, the product of your Utah stations and Idaho stations is co-mingled, so that you cannot identify, with respect to any one customer, whether he is getting energy generated in Utah or in Idaho or both? But you are able to ascertain with fair accuracy, at least, the losses which occur through lines losses, or use, or transformer losses and so on between Terminal stations and the point of delivery to customers?

A. That could be done.

Q. When you spoke of the future operations of the company being similar to its operations as described by you during last year or preceding years, that was with consideration of the fact that the question of markets, or demands by consumers in the future is a matter of speculation?

A. Well, I think I said that I saw no reason to expect any great change.

In the operation of our hydro-electric plants we may at one moment be using all of the water which is there available—that is, generating the maximum amount of energy possible by the utilization of that water to which we have a right, and another time be using only a fraction of that [fol. 233] water. And when the demand upon the system does not require us to use the full capacity of all our generating plants, it is in the control of the dispatcher whether we utilize a station in Idaho to supply that demand, or a station in Utah.

Q. You spoke of the fact that the generation and use were simultaneous, and that delivery was accomplished immediately on the closing of the switch. Do you mean that that is true to an absolute degree?

A. I mean to a practical degree.

Q. There is a very slight delay there before, in response to that order for an increased load, the generators can respond to the increased output needed?

A. Well, I have to take other people's word for that.

Redirect examination.

By Mr. MacLane:

Q. You stated on direct that there is a deficiency of energy from the Utah section plants to supply the Utah

load. What effect would that deficiency have on the flow of power in the Utah section to or from Terminal?

A. It would cause the flow to be from Terminal.

There is no input to Terminal from the Utah section plants under ordinary conditions which could be measured.

There is not any place beyond Terminal, assuming that we could place meters at the end of the 130,000 volt circuits there, at which we could measure the power or energy originating on the Bear River system as such.

This power or energy that I refer to as coming down over the 44,000 volt lines from the Bear River system is first used to supply customers along the way in Utah and then delivered at Terminal itself.

It is inter-connected with the Utah section lines and stations, such as Logan and Hyrum, as shown on my exhibit. [fol. 234] We cannot distinguish in any way, by any form of metering, after it reaches the Utah section, whether the energy originates in Idaho or in Utah.

Cutler was connected directly to the 130,000 volt circuits, and its power feeds over those circuits into Terminal. When Cutler is in operation we could not distinguish by any meters which might be placed at Terminal, the origin of the power at Terminal, as between Idaho and Utah. The Cutler power or energy is co-mingled with that originating at the Idaho plants.

Energy from the different generators at various stations is brought together at the station bus which comprises part of an enclosed metallic circuit. There is no transformer or other break in the metallic circuit of any kind there.

As to the nature of a leakage from the transmission, such leakage is caused by faults—by imperfections in the line.

Speaking technically I do not understand that current is utilized by the consumer. The consumer uses energy. Energy and current are not the same thing.

The cost of transmission lines might run from five to ten thousand dollars a mile, but the steel tower high tension transmission lines cost considerably more than that.

Recross-examination.

By Mr. Barber:

It is electrical energy that is measured to the consumer, and he is billed on the basis of that measurement.

Redirect examination.

By Mr. MacLane:

Q. Bills also come that include a power component?

A. I believe that they do, in the nature of what is some-
[fol. 235] times called a demand charge, entirely independent of energy consumption.

G. M. GADSBY, a witness on behalf of plaintiff, testified:

Direct examination.

By Mr. Corey:

G. M. Gadsby, Salt Lake City, Utah. President and General Manager of the Utah Power & Light Company since February, 1929. I am familiar with the generating stations, transmission and distribution lines of the company, located in Idaho, Utah and Wyoming, and the manner of maintaining and operating them, and with the commercial operations of the company. The company is engaged in the generation, transmission, delivery and sale of electric power and energy to its customers in Idaho, Utah and Wyoming. The company delivers electric power to individuals and corporations for use in their homes, offices, mills, mines and other industries. We sell a small part of our energy to municipalities and other corporations for delivery by them to their consumers.

As of December 31, 1930, there were 91,986 customers. The number now is approximately the same as it was then. As of the same date, the number of customers in Idaho was 10,144. In Utah, 80,299. In Wyoming, 1,543. These customers get electric power and energy from our system under contract with our company.

This contract consists of three parts. An application for service, a schedule, and the rules and regulations.

PLAINTIFF'S EXHIBIT "D"

Leaving out the name of the consumer, the formal part, the date and the signature, the application reads as follows:

"X, A Corporation, herein called Consumer, applies to Utah Power & Light Company, herein called Company, for

electric service to the amount of 1,000 horsepower, in the form of three phase alternating current, at approximately 60 cycles per second and 44,000 volts, for Consumer's mining operations at or near Eureka in Utah County, State of Utah, under Company's Schedule No. 1, Tariff No. 2, and for a term of ten (10) years from date of commencement of service hereunder, not later however, than November 1, [fol. 236] 1927, Point of delivery shall be as specified in Rule 2 of the Company's Rules and Regulations.

"Consumer agrees to conform to and abide by the Schedule hereinabove designated and Company's Rules and Regulations governing this Service, making all payments thereby required, including all minimum charges. Said Schedule and Rules and Regulations are hereto attached and made a part hereof.

"All payments shall be made at Company's office in Provo, Utah."

"This schedule is applicable to all consumers, for alternating current, three phase service, supplied at voltages in excess of 15,000 volts, for power purposes only.

"Charges:

(a) Demand: Two dollars ($2) net per month per contract H. P., which charge entitles consumer to use free during such month 100 K. W. H. for each H. P. of contract power.

(b) Energy: 1.00c net per K. W. H. for the next 100,000 K. W. H. of monthly consumption; .85c net per K. W. H. for the next 10,000,000 K. W. H. of monthly consumption; .80c net per K. W. H. for all excess monthly consumption.

"Rules and Regulations: Service under this schedule is subject to the company's General Rules and Regulations now or hereafter on file in the Company's office and with the Public Utilities Commission of the State of Utah. In case of conflict between any provision of the schedule and such Rules and Regulations the schedule shall apply."

With reference to the charges, the schedule provides certain discounts, and also seasonal rates when the service is taken for less than the entire twelve months.

Rules numbers 1, 2, 3 and 44 of Rules and Regulations which are part of the contract were read:

[fol. 237] "1. Electric service is the furnishing of electric power and energy in the form, at the voltage and for the purpose specified in the application for service. The Company will not change the form or voltage thus specified so as to interfere unreasonably with the proper operation of the Consumer's apparatus.

"2. Point of delivery is the point where the Company wires or apparatus are connected with those of the Consumer. Unless otherwise specified in the application for service, such connection will be not less than two feet outside the exterior walls of the Consumer's building, for low voltage service (100-440 volts) and at the manhole or pole on the Company's transmission or distribution line nearest the Consumer's place of operations for service in excess of 440 volts.

Each point of delivery shall be measured by a single meter of each kind needed for each consumer served. Two or more points of delivery to one consumer shall be considered as separate services and bills separately calculated for each point of delivery.

"3. Delivery of electric service is the maintenance by the Company, at the point of delivery, of electric service at the voltage and in the form specified in the application.

"44. Increase of Consumer's Demand: Increases in Consumer's demand, not exceeding 100 h. p. and within the capacity of the portion of Company's transformers and circuits used for Consumer's service, may be made at any time by use. No greater increases shall be made, except upon acceptance by the Company of written notice from the Consumer to the Company, not less than 60 days before the date when such increase becomes effective. The Company may decline to meet such increased demand when it has not the required additional power available for use by the Consumer at the point of delivery; but in such case the Consumer shall be relieved to the extent of such additional demand, from his obligation to take service exclusively from the Company."

[fol. 238] Mr. Corey: Let the record show that copy of this contract is marked Plaintiff's Exhibit "D" for identification.

Q. I will ask you if the contracts between the company and other consumers are similar to this one?

A. This contract is used for all consumers taking over 15 h. p., and for consumers less than 15 h. p., we have a form of card application that is signed by the consumer and the company, and is in substance the same language as the application, from which I have just read. The card application refers to the schedule and the same rules and regulations from which I read.

(Plaintiff's Exhibit "E" marked for identification.)

All customers enter into a contract on either one form or the other before they are connected to the company's system.

After the customer signs the application, his appliances, or consuming devices, are connected to the company's lines, and thereafter service is available at all times, day or night, by the customer simply throwing a switch.

Q. In the development of the electrical systems, are these contracts usually made or at least in prospect, before additional developments are made to meet the demands?

A. Yes. The demands for power increase, and as these demands increase, extensions are made to the system, and provision is made for taking care of the requirements, and before such extensions and additions are made, there are either contracts available, or substantial expectations of making such contracts and having the consumers demand additional service.

Q. Do you keep a record of the kilowatt hours, measured at the *at the* generating stations?

A. Yes, for statistical purposes, and in order to keep track of the performance of each plant, the capacity for supplying additional customers' demand, and the relative costs. These records are of value for determining and com- [fol. 239] paring operating costs and planning future extensions.

These station records are not used in billing consumers. The important thing in billing consumers is the reading of the customers' meters, because they measure the service that he contracts and pays for, and for which the company receives payment.

The total gross kilowatt hours measured on the system for the year 1930 was 758,692,000 kilowatt hours.

The total kilowatt hours measured and reported by consumers' meters as delivered to consumers during the year 1930 was 623,761,000 kilowatt hours.

The company's gross receipts received from the sale of electric power or energy during the year 1930 in Utah was $9,711,000 and for Idaho approximately $735,000 and for Wyoming approximately $146,000.

The average rate per kilowatt hour for the gross energy measured on the company's system during the year 1930 was 1.397 cents per kilowatt hour.

The average rate per kilowatt hour for the net energy measured to consumers during that year was 1.698 cents per kilowatt hour.

If the company were obliged to pay a tax in the amount of one-half mill per kilowatt hour on all of the power and electric energy generated in Idaho, such a tax would be a charge of approximately 3.58 per cent on the average sales values of the gross kilowatt hours, measured at the Idaho plants, and if assessed against the kilowatt hours, measured to consumers, approximately 2.94 per cent.

Mr. Corey: The following questions and answers with relation to Section 5 of the Act may be received, subject to the provision that was made in tha taking of Mr. Hale's testimony with reference to the same question.

Mr. Barber: That is agreeable, subject to the same objection on the part of the defendant.

I am familiar with the so-called exemption provision of [fol. 240] the Idaho Kilowatt Hour Tax Law, commonly referred to as Section 5 of the Act.

Q. Will you please explain the difficulties your company would experience if it attempted to comply with this section of the law?

A. First, the law proposes to exempt all electricity and electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho, except where the water so pumped is sold or rented to such irrigated land. One company connected with our lines, and pumping water in Idaho, irrigates land in both Idaho and Utah. Our company has no knowledge or means of obtaining knowledge of the amount of land so irrigated in either state, and could not determine the proportion of the power

used at its pumping plant for irrigating land in Idaho. Again, our company has no knowledge as to whether water pumped by different persons and corporations connected to our lines is sold or rented. Again, the Act provides that the full amount of the license tax which would have been due from the producer if such exemption had not been made shall be credited annually for the year in which the exemptions are made on the power bill of the consumers. These consumers' meters are read each month and the billings are made upon the readings, whereas the Act provides that the credit shall be made annually for the year in which the exemptions are made. It does seem that the credits can only be made at the end of the irrigation season, and at that time bills will be rendered to the irrigator and paid by him. The reading of the different meters is made at different times, that is, a system of rotation is used, and one irrigator's meter may be read on the 18th day of the month and another on the 20th, and another on the 21st, and so forth. Next, the Act provides that the full amount of such license tax which would have been due from such producers of electricity and electrical energy, if such exemption had not been made, shall be credited annually for the year in which the exemptions are made on the bill to the consumer. The billings to irrigators are based on measurements made at the place of use. The computation [fol. 241] of the tax is based on measurements made at the place of production. These two points of measurement, that is, the place of production and the place of use, are sometimes separated by many miles, and intervening losses, or system uses, may amount to as much as twenty per cent. There is no means available for determining either the total of the system uses or losses, applicable to the irrigation load in the aggregate, or to the uses or losses that are applicable to the individual irrigation consumers. Measurements at the station give the gross kilowatt hours at the station. The losses will vary to some extent with the distance of transmission to the consumer's place of use, and the character and size of the conductors, and also in relation to the size and number of transformers that intervene between the station and the main transmission line and the consumer's point of use. The irrigation customers are served various voltages, from 44,000 to 2300 volts. So-

we have this situation: We cannot follow the provisions of the Act requiring determination of the exemptions at the so-called point or place of production, and the Act does not give us any other means of determining the basis of exemption. Finally, the credits to the irrigators, after all, means that the company pays to the irrigator a sum equivalent to the tax, and this sum is paid out of the earnings of the company.

Mr. Barber: No cross-examination.

FRANK W. PEEK, a witness on behalf of Plaintiff, testified:

Direct examination.

By Mr. MacLane:

Frank W. Peek, No. 35 Waverly Street, Pittsfield, Massachusetts, age 50. Electrical engineer employed by the General Electric Company at Pittsfield, Massachusetts. I am Chief Engineer of the Pittsfield plant. The Pittsfield plant of the General Electric Company is devoted primarily to designing transformers and other apparatus for transmission lines, and also do the main research work in connection with transmission. We have, for instance, a five million volt laboratory for studying advance transmission problems, and employ about seven thousand men. I have been [fol. 242] interested in connection with the development of the art of transmission for many years, particularly in research work.

I graduated as an electrical engineer from Stanford University in 1905. After graduation, I went with the General Electric Company, in the student course, at Schenectady, where later I became consulting engineer with the late Dr. Steinmetz. Later, when the high voltage research and transmission work was transferred to Pittsfield, I was transferred there, to be in better contact, particularly with the high voltage research laboratory. I might say that while I was in Schenectady, I was given a degree as Master of Electrical Engineering by the Union University. My first work at Pittsfield was connected with research on all

kinds of high voltage, and particularly with transformers. In 1927, I was made Chief Engineer of the transformer department of the General Electric Company, located at Pittsfield, and held that position until the first of the year 1931, when I was made Chief Engineer of the Pittsfield works. All that time, I retained my interest in the laboratory, still taking personal charge of that work. In that laboratory, we have produced voltages up to five million volts. I also have inventions relating to high voltage transmission which are utilized by the General Electric Company. I have published papers and books on the subject of transmission and transformers so that the information which we gathered at the laboratory could be utilized throughout the world in designing electrical transmission lines and apparatus. I believe it has been. The name of the book is "Dielectric Phenomena in High Voltage Engineering." It was first published, I believe, in 1915, and has gone through several editions. It has been translated into practically all languages, but not all authorized editions. I am the author of probably 100 or more papers which have been published in technical magazines on these subjects.

I received the Thomas Fitch Rowland prize from the American Society of Civil Engineers, for work on transmission. I received a similar medal, the Levy Medal, from the Franklin Institute in 1926. I am a Fellow of the American Institute of Electrical Engineers, a Fellow in the [fol. 243] American Association for the Advancement of Science, a Fellow of the American Physical Society, and also a member of the Franklin Institute. I am a director of the American Institute of Electrical Engineers, and a representative of the American Institute of Electrical Engineers on the National Research Council. I have at times been Chairman of the Research Committee of the American Institute of Electrical Engineers, and also the Electrical Physics Committee, and have served on various committees having to do with electrical transmission and transformers.

I am the author of the article on Transformers in the 14th Edition of Encyclopedia Britannica.

Q. In your testimony, we are going to discuss some of the problems involved in the transmission of electrical energy, including the part played by transformers in that

process. Preliminary to that discussion, we will require the definition and explanation of fundamental electric concepts. Will you please define electricity, so far as it can be defined?

A. Electricity is a subtle imponderable physical agency manifesting itself in certain known ways. While the essence of electricity may be considered as yet somewhat obscure, its laws and characteristics are so well known by the electrical engineer as to enable him to design electrical apparatus and predict their performance with great precision. In speaking of electrical matters, the word "electricity," is used popularly very loosely as applied to a variety of factors which are fundamentally different and should be carefully distinguished, such as electric current, voltage, power and energy.

Electricity may be in rest or in motion. Electricity in motion constitutes electric current. Electric current has a number of distinctive characteristics.

First. The flow of electric current differs from the flow of fluids, in that an electric current always makes a complete unbroken circuit. For instance, as much electric cur-[fol. 244] rent flows back into a generator through one terminal as flows out of it over the other terminal. In this respect, the flow of an electric current is somewhat like the motion of an endless belt.

Second. As may be inferred from what I have just said, electric current is not retained or consumed by the electrical loads on a circuit. For instance, as much electric current flows out of an incandescent lamp to a generator, as flows into it. Electric current is never bought or sold. The popular expression of "buying electric current" is a misnomer, the correct expression being the "buying of electrical energy."

Third. Practically any magnitude of electric current can be set up, or induced if desired, with practically no power or energy associated therewith. An electric current, as such, has therefore no monetary value.

Fourth. Electric current is associated with electrical energy as a vehicle for said energy, but such association, or later disassociation, does not alter the magnitude or na-

ture of the electric current. Current measuring instruments cannot distinguish between a current associated with energy and that which is not so associated.

Fifth. Electric current is measured in amperes, while electric energy is measured in kilowatt hours—two distinct quantities, not convertible into each other, nor expressible in terms of each other.

Electric voltage, called also electric tension, and electric motive force, is a state of electro-magnetic medium somewhat analogous to mechanical pressure. Some of its distinctive characteristics are:

First. Electric voltage, somewhat like mechanical pressure, is exerted between two or more points, as between the terminals of a generator, between the wires of a transmission system, between the terminals of a socket, or between the terminals of an incandescent lamp. It does not circulate, like electric current, neither does it flow.

[fol. 245] Second. Electric voltage can exist without being associated with electric current or with electric power or energy, similar to the possibility of mechanical pressure being maintained without motion taking place or work being done. Wires or electrical apparatus are spoken of as "alive," when there is electrical pressure or voltage on them. A live wire need not be conducting any current or transmitting any power.

Third. Electric voltage, like electric current, is a necessary vehicle for electrical energy, but it is not the same thing as energy. Voltage is measured in volts; energy in kilowatt hours, and the two are not convertible into each other or expressible in terms of each other. Voltage that is associated with energy and that which is not so associated, cannot be distinguished by any instruments for the measurement of voltage.

Power manifesting itself through the instrumentality of electric voltage and current is known as electric power.

Electric power in a circuit is proportional to the product of simultaneous magnitudes of current and voltage in that circuit. Current alone, or voltage alone, is not an adequate vehicle for electric power, but their simultaneous presence is necessary.

Electric power flows from a generating point to a point of utilization. It does not circulate like current, but is absorbed or consumed by the load, by conversion into another form of power, as, for instance, mechanical power in a motor. In a circuit that is alive with voltage or tension but otherwise inactive, with no power flowing, power flow is initiated at a load point, not at a generating point. For instance, when an electric lamp is turned on, an influence corresponding to demand for electric power appears instantly at its terminal and extends to the generating station. The time required for this influence to reach from the load point to the generating point is so infinitesimal that the two events are for all intents and purposes, simultaneous and integral, but the control and initiation of power [fol. 246] rests at the load. Power cannot be transferred through a generator unless it is initiated by a load.

The physical path of the flow of power between two points is always absolutely continuous, without any gap, regardless of any intermediate apparatus. For instance, in a hydro-electric system, the power of falling water follows an unbroken path, passing to the turbine blades by contact, thence through the turbine shaft to the electric generator, through the generator into the line, thence through transformers in the line to the customer's load.

Electric power used through a period of time is known as electric energy. It is measured in kilowatt hours, and is bought and sold as an article of commerce.

Electric energy is not the same thing as electricity, even though in popular parlance the two are used synonymously. Electricity is merely a medium or vehicle for energy in electrical form. Technically, electricity is measured in coulombs, while electric energy is measured in kilowatt hours—two units of altogether different category, not expressible in terms of each other—electricity by itself has no monetary value.

Energy cannot be created or destroyed. It can, however, be converted from one form into another form. When we say that energy is "absorbed," or "consumed," or "utilized," what is taking place is its "conversion" from one form to another. Such "conversion" of energy, however, does not imply a change in the nature or essence of energy,

but merely its transference from one type to another type, as for instance, from an electro-magnetic to mechanical, through the instrumentality of an electric motor.

The essential apparatus interposed in an electrical system to accomplish the transfer of energy from a source in nature, such as falling water, to the place of use, are generators and transmission lines. Transformers may or may not be used. As a matter of fact, they are usually used. [fol. 247] A generator is an instrumentality whereby energy may pass from a mechanical medium into an electrical medium. A generator does not in any sense generate or produce current or electricity. It does not generate energy. It can be said to generate an electrical tension or voltage, that is, a certain state of electrical medium whereby it becomes possible for electricity that is already dormant to get into circulation, and whereby it becomes possible for a useful load to draw energy from a distant waterfall.

The function of a transmission line is a link to maintain the energy path between the waterfall and the consumer.

An electrical state is characterized with voltage and current. Different types of circuits require different values of voltage and current. Transformers are electrical links, making it possible to connect circuits of different voltage and current with each other. The real reason for using a transformer is an economic one; that is, they are not a necessity.

A transformer consists of two or more windings coupled by a magnetic core, and insulated by a strong dielectric. The current and voltage of each winding are separate from those of the other winding or windings, but, by virtue of their coupling, current and voltage in one winding are said to induce corresponding current and voltage in another winding. Thus, if the switch of a load is closed, permitting a current to circulate in it and the transformer winding connected to it, this current induces a corresponding current in the winding connected to the generator, and a current flows through the generator.

Insulation which separates the windings connecting the generator and load, respectively, is completely permeated by the intense electric and magnetic lines of force. Power entering one winding passes into this insulation through

electro-magnetic fields, then into the other winding, and from it to the connected apparatus. It is important to realize that although electric current cannot flow through the insulation of a transformer, electrical energy does flow right through it with perfect ease. An analogy may be [fol. 248] helpful. The walls of the tubes of a boiler in a power house segregate or insulate the water and steam from the coal and its flames and smoke. But the heat energy of the burning coal passes readily right through the walls of the tubes to the water.

The role which a transformer plays is similar to that of a set of reduction gears. Each gear has its own rotation (corresponding to electric circuits) separate from those of the other gears. Each gear has a different velocity (corresponding to current) and pressure (corresponding to tension) from those of the other gear. But energy flows from gear to gear without a break or gap in its path.

A transformer then transforms current and voltage, not power or energy. The latter flows right through its insulation without alteration.

The function of an entire hydro-electric system is to establish and maintain a free path of communication for energy between the waterfall and the consumer's premises, whereby consumers may be able to draw power as energy from the waterfall at any time and in any reasonable quantities that they may desire.

Energy is not manufactured, stored and shipped—it is merely transmitted through a sequence of different types of conveyances including hydraulic, mechanical and electrical branches.

Q. What is it, speaking in electrical terms, such as you have used them, that is delivered by means of such a system to the consumer and used by him?

A. Energy.

Q. And that is the same energy that is in the waterfall?

A. Yes.

Q. Does the consumer use in his ultimate use, energy in electrical form, or in some other form?

A. In some other form. For example, the operation of a motor to in turn operate, or rather make motion in the [fol. 249] machine possible (mechanical energy); in the case of light we use energy to produce light (light energy), or

in the case of an electric range we use energy to produce heat (heat energy). In a light a considerable amount of energy is used as heat. In the case of light the consumer does not use electricity, he simply uses energy that it conveys. In the case of refrigeration, the energy is applied in practically the same way. Mechanical motion operates and performs what is necessary—that is the first step in mechanical energy—rotation.

The electrical system, including all of the various parts, has no other useful function than to transfer energy from its origin to the place of desired use.

Electrical energy is measured by watt hour meters, and is expressed commercially in terms of kilowatt hours.

Q. While I believe you have already stated, I shall ask you expressly, does the consumer receive or use electrical current?

A. He doesn't use electrical current. The same amount of current that flows into his device, whatever it is, flows out of it. He does not use electric current, and his meters will not tell whether that particular electric current is conveying energy or not. It has the same reading both in and out.

He does not receive or use voltage as such.

The power or energy used by the consumer is not different or changed through the intervention of transformers from that which passes through and reaches the generator?

Cross-examination.

By Mr. Barber:

Consumers could get heat from the use of coal, or the burning of gasoline or gas, and could also get light from burning gasoline. And you can get mechanical work by using combustion motors.

There is a decided difference there—in these cases you are dealing with material substance.

[fol. 250] Q. With the use of the electric system, we have greater facility in the use of devices by the consumer than is true with energy that is made by the burning of coal or gasoline? From his own point of view, he gets light immediately when he presses a switch, not having to take the

time to strike a match, or adjust a gasoline lamp, for instance?

A. Yes. That is some of the advantages of electricity.

Q. You could transfer the energy in the falling water by transferring the water to another point, where you could get the motion in the water?

A. You do get energy out of water—it is the energy that is brought to the consumer—it does come from falling of water—is that what you mean?

Q. Yes—if you could flume the water to another point, the water energy might be utilized there?

A. It is possible. I would have to know the circumstances.

You can transmit the mechanical energy that is in the turbine shaft through mechanical agencies to the point of use. It is physically possible to transmit it a considerable distance that way. It is economically cheaper to transmit electrical energy than mechanical energy over any considerable distance.

Q. When we speak of energy in the falling water as the same energy, no doubt we must distinguish in a practical way to this extent, that it is in a different state or form when it flows to the generator, than after it flows from the generator?

A. Well, of course—we are getting on philosophical grounds here, but it is the same energy. The energy is from the water, and it is the same energy that was in the water that the consumer uses.

Q. When you speak of generation, generation is necessary in order to have transmission of it over the electric circuit?

A. That is what I am trying to bring out—we do not generate——

[fol. 251] Q. Using the term which is generally used in electric industries?

A. I do not thinks so.

Q. You would say that it is unnecessary to use that mechanical device which we call the generator in order to transmit the energy over the wires?

A. Well, I wouldn't say that—we must use some device.

Q. Through the operation of that device, you transform or convert energy from one state to another?

A. I would say that the transfer is from one vehicle to another.

Q. Does it have any different physical characteristics?

A. Not the energy.

Q. It manifests itself in different forms?

A. Yes. It does.

Q. Would you have to use the generator in order to utilize the electric circuit that exists in electric devices that are attached to wires in the transmission and distribution lines?

A. Yes. There is some similarity, perhaps, between the operation of the generator and the transformer; if I were starting the industry, I might call the generator the transformer. That is because its function is to transform energy, or make it available so that it can be transmitted over the transmission line. In the transmission, the transformer is not at all necessary. We could build a generator to get as high voltage as we wish, but it happens that it is easier and more economical to do it with a transformer. A transformer in that way is analogous to the gear system I have suggested. It is a gearing device, that is all, and does not interpose any obstruction to the energy. The energy flows right through the same as it would through here. The transformer does not change the energy at all.

Q. We will consider the plaintiff's system that generates [fol. 252] 2300 or 6600 volts—it would not be practicable to transmit that with that voltage any distance over their wires?

A. It depends. I do not know what you mean by distance.

Q. 100 miles.

A. Any such distance we would wish high pressure. The transformer is just an economical measure to reduce friction losses.

Q. Otherwise, you would have to use a large conductor?

A. Yes. Technically, there is no reason why we couldn't use 2300 volts as well as higher voltage, but it would cost tremendously more, that is all, if we consider a large amount of energy involved. Mechanical devices are constructed for the utilization of energy to certain voltage with slight variations permitted.

Q. A device so constructed as to utilize the 2300 or 6600 volt current which came from the generator could not be

connected to the 130,000 volt current upon the other side of the transformer used in connection therewith?

A. It might be, but there would be no reason for doing that. If we wish to connect with that voltage, we can easily calculate what is necessary, and design for that purpose./

Q. Would you say it could be used?

A. It might, not perhaps economically, but the point is that we wouldn't use it that way. We would design a device, which we could do with close precision.

Q. Assuming that a motor is so constructed that it can be directly connected with a line which comes from a generator generating 6600 volts. You wouldn't attach this same motor intentionally to a 130,000 volt line?

A. No. If I wished to use a motor connected directly with that line, I would design a motor that would function with that line.

Q. A motor designed for 6600 volts or 2300 volts would either burn out, or something would disrupt the transfer of energy?

[fol. 253] A. Yes. Just the same as energy through a shaft, I probably might want to have a gear system corresponding to some particular use. By designing for the proper volts, if it has the same power rating, it takes the same energy from the line without change, from the waterfall.

Q. You spoke a moment ago of lamps. For instance, house-hold appliances designed to utilize 110 volts. You couldn't connect those directly with either 2300 volts or 6600 volts?

A. They wouldn't last very long. It would be foolish to do such a thing. In either case, if designed to take a certain amount of energy, that energy would be the same energy coming from the waterfall.

Q. One thing I didn't understand. You spoke of the entire system as merely a device for transferring energy from the falling water to the consumer?

A. Yes.

Q. You do not transfer all the energy, however, that is generated by the turbine shaft?

A. No. Nothing in nature is 100% efficient, and a certain amount of energy is required to keep the system going.

Q. Ordinarily called losses?

A. Similar to friction losses. We have it in all machines, I might say, however, that it is probably less in the electrical system than in any other.

Q. Is there not more by using the electrical system than merely mechanical energy in some instances?

A. Possibly in some instances. It is hard to generalize on these things. The best transformer, for instance, is 99½% efficient.

Q. In addition to losses in the generator and transformer, you have line losses?

A. Yes. In the transformer, we have losses in keeping the transformer in operation. I do not believe I emphasized [fol. 254] this loss, because it is so negligible and immaterial.

Q. Speaking of the consumer using energy in another form, such as heat energy, or mechanical energy,—he does buy and receive electrical energy, however?

A. I wouldn't say so. He wouldn't care if some other vehicle brought it to him, if it were just as convenient to him. He buys energy, and that does the work.

Energy is what does it. He is not interested in the mechanism necessary.

Q. In these different devices that are attached to the electrical system, it is electrical energy that is bought and sold?

A. Energy is bought and sold.

Q. Wouldn't you say electrical energy?

A. All he uses—it does the work—perhaps we are playing on words. The facts are, he uses the energy of the waterfall. What vehicle brought it to him is immaterial to him, except that as to certain devices constructed to take it from the vehicle it is more convenient.

Q. I had this question in mind. In common practice—at least the company's monthly bills to him show whatever he pays upon the meter readings.

A. Yes.

Q. And that meter measured the amount of electric energy consumed to that point?

A. It measures energy expressed in kilowatt hours.

Q. Isn't that the expression which we employ in connection with electric energy?

A. Yes. But instead of kilowatt hours, I could make the meter read h. p. hours.

Q. It doesn't require electrical energy to cause that meter to register the way it is constructed?

A. Yes. It is so constructed. I might use an electric meter to measure something else. I would use a different [fol. 255] type of meter. It is just a matter of convenience, that is all.

Redirect examination.

By Mr. MacLane:

Q. I understand from your testimony that the real reason for the transfer of energy through the electrical medium, by so-called electrical facilities, is to facilitate the transfer, isn't it?

A. Yes. That is the vehicle, in other words.

Q. Could we transfer energy over any appreciable distance by some other means, and accomplish the same results that are today accomplished by the transfer of electric energy through appliances adapted to other forms of energy, such as for example, mechanical energy?

A. I might say for instance, instead of going through the electrical form or the electrical path or vehicle to carry energy—I might use a shaft, if that is what you have in mind, and transmit mechanically from that waterwheel to some distant place at which the energy might be utilized without going through the electrical phase at all. For instance, I might cook with it.

Q. Could you transfer energy mechanically, and at the point to which it is transferred acually use it by converting it into heat energy for cooking?

A. I might for instance, have a water turbine, just a waterwheel—the energy of the waterfall would pass through the turbine blades to the shaft. The shaft would turn, and I might have a pulley on that shaft. Now, on that pulley I might have a belt going to another shaft at some distance, and that shaft at the distance be turning. That shaft at the other end might, for instance, go into a tank of water, and by friction or rubbing, might produce heat which might be used in cooking. Now, I might put on what corresponds to a transformer in that system. Instead of going directly from the steel pulley or waterwheel shaft, I might go

through from that pulley to a countershaft, and have another pulley on that shaft to get different speed. You would [fol. 256] then get the transformer effect. You could convert that energy in a mechanical form into heat. You might do the same thing electrically by using a generator, a transformer and transmission lines. You might even produce light that same way, but I am not saying that I would do it. I am just saying what could be done.

Q. And methods of doing so are known to scientists; the losses, however, would be much greater than if transferred through the electrical system?

A. Generally speaking, that is true of other uses to which so-called electric energy is put.

Q. Now, you have said that the whole system is constructed essentially to more efficiently accomplish the transfer of energy. Is that true of such parts of the system as the transformer, for example?

A. Yes. In fact, the transformer in effect makes part of an energy highway—makes the highway better for the transmission of energy.

What we call in electrical parlance, kilowatts, is merely a measurement of energy.

A kilowatt may be readily translated, into horsepower.

Approximately three-fourths of a kilowatt equals a horsepower.

Similarly, a kilowatt hour may be translated into terms of mechanical energy. Horsepower hours, it might be called. After all, these are merely mechanical expressions of the ability to accomplish work. What the customer really wants is something to do work, and that is what he pays for, if I may get a little bit commercial.

Q. I think a question was asked by counsel for the State regarding the difference in appearance between a revolving shaft and an electric transmission circuit. Does that represent a difference in energy, or a difference in the vehicle, as you have called it, for the transference of that energy?

A. Merely a difference in the vehicle. The ability to do [fol. 257] work will be the same; you can't see the energy in either case.

Recross examination.

By Mr. Barber:

Q. You spoke of transmitting this energy by means of a shaft and pulley. It would be practically impossible to transmit that a distance of 100 or 200 miles?

A. I wouldn't say that it would be impossible, but with present bearings, and so forth, it wouldn't be very efficient.

Q. Through friction losses, only a small percentage of the power would reach the terminal?

A. Probably. There may be other reasons, like expense.

Q. While it is physically possible when energy is transmitted in such fashion, to obtain heat and light from it, you couldn't adapt it to the present devices which we use in our home or shop or office, without the interposition of a generator? I mean those lamps, and electric heating stoves and cooking stoves?

A. I didn't mean to convey that impression. These are naturally developed to take the energy conveyed in the electrical vehicle. Now, if we wish to convey in some other way, that same water power energy, we would design some other devices for that.

Q. Does science know today how to operate a radio or x-ray by any other means than by electric energy?

A. Why, probably not as it has developed, but we might use, for instance, light instead of the ordinary radio ray, but on the other hand, we may look at light as an electro magnetic phenomenon, too.

Redirect examination.

By Mr. MacLane:

Q. I find in your direct testimony you describe energy, or electric energy, as an article of commerce. Will you explain that sentence?

A. I mean that energy as distinguished from current and voltage is what the company gets from nature—transfers it [fol. 258] to the consumer and what the consumer pays for. I do not mean to attribute to it properties of substance or matter.

Recross-examination.

By Mr. Barber:

Q. Science doesn't know any connection between energy and matter?

A. Perhaps—there are various theories. I think it would be too deep to get into here.

Q. Isn't it considered, however, a matter of question as to whether or not ultimately we will be able to show that all matter is made up of energy?

A. I do not know. That is speculation, of course. We have lots of theories and speculations. I think the best theory is that those are not the same. I do not believe you could call them the same by any stretch of the imagination.

Mr. MacLane: The plaintiff rests.

Defendants' case.

Mr. Barber: We offer in evidence Defendants' Exhibits Nos. "F" to "P", both inclusive, the same being certified copies of water license permit granted to the plaintiff by the State of Idaho, relating to the use of certain water power in the streams of Idaho for the generation of electric power by the system. I understand that it is agreed that these be considered identified.

Mr. MacLane: Reciprocating Mr. Barber's courtesy, we agree that these may be offered without further identification. We further agree that they may be offered to the same force and effect as if offered before the court, and waive any objection based upon the grounds that they are not included within the order of reference. Subject to the foregoing agreement, we object to their receipt in evidence, on the ground that they are incompetent, irrelevant and immaterial to the issues involved in this case, in that they lend no support to the tax which is under attack, and have no [fol. 259] bearing upon the question as to whether such tax is or is not a burden upon Interstate Commerce.

Typical of above exhibits is Exhibit No. — which is as follows:

[fol. 260] EXHIBIT IN EVIDENCE

2790

State of Idaho

License and Certificate of Water Right

Water License No. 10009. Amount 700 sec. ft.
Water District No. 36-A. Priority 12-20-1913.

This is to certify that Utah Power & Light Company of Salt Lake City, Utah, made application for a permit to appropriate the public waters of the State of Idaho, dated December 20, 1913; that Permit No. 10009 was issued under said application; that Certificate of Completion of works, with a carrying capacity of 700 second feet, was issued thereunder on March 16, 1921, showing that said works were completed on the 18th day of September, 1920; and that on the 18th day of September, 1920, Utah Power & Light Company of Salt Lake City, State of Utah, made proof to the satisfaction of the Commissioner of Reclamation of Idaho, of the right to use the waters of North Fork Snake River, a tributary of Snake River, for the purpose of generating power, under Use Permit No. 10009 of the State Engineer and that said right to the use of said waters has been perfected in accordance with the laws of Idaho, and is hereby confirmed by the Commissioner of Reclamation of Idaho and entered of record in Volume 5 of Licenses, at page 2790, on the 16th day of March, 1921;

The right hereby confirmed dates from December 20, 1913;

The Point of Diversion is located N. 9° 50' E. 2045 feet to N.E. Cor. Sec. 1, in the SE¼ of NE¼, Sec. 1, T. 7 N., R. 40 E. Tp. 7 N. R. 40 E. B. M. County of Fremont.

That the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually needed and beneficially used for said purposes, and shall not exceed 700 cubic feet per second.

Description and location of use:

That the place of use of said water is at the St. Anthony Power Plant, located in the SE¼ NW¼, sec. 1, T. 7 N., R. 40 E. B.M.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, as provided by the laws of Idaho.

Witness the seal and signature of the Commissioner of Reclamation, affixed at Boise, Idaho, this 16th day of March, 1921.

W. G. Swendsen, Commissioner of Reclamation.
(Seal.)

[fol. 261] Mr. Barber: May it be stipulated that subject to any objection of the plaintiff as to the character of the evidence offered, a competent witness, if now produced at this hearing by the defendant, would testify to the effect that practically all electrical energy generated in the State of Idaho is generated by the employment of power in falling water, and such witness may be considered as so testifying, subject, however, to the objections of plaintiff.

Mr. MacLane: Without conceding its materiality, we agree that that is a correct statement of fact, except for minor industrial uses which are not subject to the Tax Act, and a witness may be regarded as having so testified.

[fol. 262] Carl Edward Magnusson, a witness on behalf of defendants, testified:

Direct examination,

By Mr. Barber:

Carl Edward Magnusson, age 59, residence 5200 16th Street, N. E., Seattle. I am a professor in electrical engineering, and director of the Engineering experiment station at the University of Washington. I received a B.E.E. Degree from the University of Minnesota in 1896, Master of Science in 1897 and of Electrical Engineer in 1906. I studied under Dr. Steinmetz at Schenectady, New York, in 1911 and 1912.

I was Professor of Physics, University of New Mexico, 1901 to 1903; New Mexico School of Mines, 1903 to 1904. I was with the General Electric Company in 1911 and 1912, and with the Westinghouse Electric & Manufacturing Com-

pany, Pittsburgh, Pa., in the summer of 1917. I was Consulting Engineer for the American Nitrogen Products Company in 1917 and 1918. I have conducted a number of tests and reports on engineering projects in the past 35 years. I was Associate Professor of Electrical Engineering in the University of Washington in 1904 and 1906. I was Professor and head of the Department of Electrical Engineering in 1906, and Dean of the College of Engineering, from 1917 to 1929. I was director of the Engineering Experiment Station from 1917 to date, and Chairman of the University Research Society from 1920 to date. I was a member of the American Committee, World Power Conference (London) in 1924, and in 1930. I did consulting work for the General Electric Company in the summer of 1926, 1927, 1928, 1929 and 1930.

I am a Fellow in the American Institute of Electrical Engineers, and was Vice-President from 1920 to 1923. I have been Chairman of various committees. I am a Fellow in the American Physical Society, and the American Association for the Advancement of Science. The others are not technical.

I have published three books. One on "Alternating Current," now in its fourth edition—another entitled "Direct Current," and another "Electric Transients," in its second edition.

[fol. 263] I am the author of some forty technical papers. My work in electrical engineering has been devoted to instruction in electrical engineering which implies that the work must be given in the practical phase as well as in the theory.

The generator is a machine or device for converting or changing mechanical energy to electrical energy, or energy in the mechanical form to energy in an electrical form. Take the large generators concerned in this case, the magnetic field is placed on a rotor, and surrounded by conductors through which the current can flow to the transmission line. By rotating the magnetic field the magnetic lines of force cut the conductors and generates voltage.

Q. Is there any particular voltage that is inherent in generation?

A. No. It is the rate of cutting lines of force.

Q. Determined by what?

A. It depends upon how strong the magnetic fields are,

how many conductors in series, and what speed or rotation, or it can be expressed in the single sentence, the rate of cutting lines of force. Different generators may generate different voltages. That will depend upon the strength of the field, the number of lines of force which cuts the number of conductors in series, and that will be expressed by the rate of cutting lines of force. These are dependent upon generator design. The amount of electric energy generated is measurable with a high degree of accuracy, after it has left the generator. In an electrical system, consisting of generating stations, transmission lines, and distribution network, the amount of electrical energy reaching any given point upon that system is capable of definite ascertainment. We can measure the flow of energy passing any point in a transmission system if we attach the proper instruments. In any system there are some losses. There are system losses, hysteresis losses, and so forth, corre- [fol. 264] sponding and quite similar to friction losses in a mechanical machine. These losses in the generator—the friction of the bearings, those due to magnetic hysteresis, and what is called copper losses, due to the resistance in the conductors. There are likewise transmission line losses—the copper losses.

Q. Generally, in the electric industry are those referred to as losses or uses?

A. Losses, that is what the engineers use.

The transformer consists of two windings—a primary winding and a secondary winding, both interlinked by an iron core. When the current flows in the primary winding, a magnetic field is set up in the iron core. The magnetic lines of force cut the secondary winding, generating or inducing electromotive force. The ratio in the relation between voltage in the primary and secondary winding is approximately the proportion to the number of turns in the two cases.

Q. Is there any similarity in the action of the transformer and that of a generator?

A. The voltage induced is in both cases produced by conductors being cut by lines of force. In the generator, the conductor is stationary, and the magnetic field, in the large type of generators, is moving which is also the case with the transformer.

In smaller generators, the fields are usually stationary, and the armature rotates, and the reverse condition of having the fields stationary and the conductors moving is present. But in all cases the magnetic induction produced is merely the relative motion of the conductor with respect to the magnetic lines of force.

Q. I understand that in neither the generator or the transformer are the two parts connected by metallic conductors, or like physical matter?

A. No. In the transformer, there is sufficient insulation between the primary winding and the core and the secondary winding and the core, so that there is no path through which the current can flow between the primary and the [fol. 265] secondary winding. The energy transfer is made magnetically. In the alternator, either the field or the armature conductors move, and there is, aside from the insulation, between the conductors and the iron core, an air gap, so that the current cannot flow between the field circuit and the armature circuit in an alternator.

Q. Does the electric energy which goes from the transformer over the transmision line have any different physical characteristics than the energy flowing from the generator to the transformer?

A. The electric energy is expressed by the product of the current, the voltage and time. If we have a transformer at the generator station and we step up the voltage then on the generator side, the current would be larger than on the transmission line side, and to compensate for this changing current, the voltage will be correspondingly higher, on the transmission lines than on the primary windings connected to the generator.

Transformers are used to raise or lower the voltage with corresponding decrease or increase in currents. Decrease in current reduces the line loss.

If energy is generated at 6600 volts, it is possible to transmit the energy at that voltage; but not economically for any long distance, say a hundred miles. The losses in the electrical system are substantial in amount. If we take merely the copper losses, they will vary as to the square of the current, and having the voltage constant will vary as to the square of the power or energy delivered. The relation of the other losses is not so readily stated.

I suppose in some cases the loss might exceed the amount of energy delivered to consumers but that would be a very poorly constructed system. The amount of energy delivered to a consumer is dependent upon the character of construction of maintenance of the system. The relative amount of losses at various parts of the system can be determined under given conditions.

On an A. C. system energy can be stored in a condenser. [fol. 266] The quantities held in a condenser are small, and would not serve, in the sense of ordinary storage, to carry the load.

Cross-examination.

By Mr. MacLane:

The source of energy which is transferred by an electrical system is in nature and already existing external to the system.

Q. As the system is really interposed for the purpose of transferring this energy from its source to the place where it may be usefully put to work?

A. Transferring and converting. You convert it to facilitate transfer and use.

Q. As a matter of fact the whole system, whatever you call its different parts, the generator, the transmission line, the transformers, both step-up and step-down, the distribution lines and the consumer's motors or other consuming devices, are all linked together and inter-related for the purpose of accomplishing this transfer and delivery in such form as the consumer can use it.

What the consumer uses in his appliance is energy—in the case of light it is heat energy—and in the case of a motor it is mechanical energy, and in some cases chemical energy, and so on.

Q. The whole thing depends, as I believe you once said in your book on alternating currents, considerable of which I have read but only the introduction to which could I understand, that the principle of the conservation of energy is the fundamental assumption and the basis upon which the argument sets?

A. Correct.

Q. And you further state in that introduction that electric energy is the connecting link or chain by which energy can be economicaly transmitted and effectively controlled?

A. Yes.

Q. Now, I find one other interesting statement in the book on "Electric Transients," which is even more incom-
[fol. 267] prehensible to me than your book on alternating currents. On page 163 of that book you state, "In commercial systems the transmission line is not an independent unit, but merely a link between the generator and load circuits. Step-up and step-down transformers, generators and load circuits, lightning arresters and regulating devices, and all the apparatus necessary for the operation of the system are electrically inter-connected into one unit." I suppose you still subscribe to that statement?

A. I think so.

Q. After an electrical system has been constructed, but before any consumers are connected with the lines, the generator remains idle, does it not, even though water may be passing through the turbine, assuming that it is excited? That is to say, the system itself consumes, if I may use that term, some of the energy which is transferred through the generator, and uses it for the purpose of magnetizing the transformers and to compensate the resistances in the system, and like uses, and after you connect consumers to this system the generator then commences to perform its functions commercially?

A. Yes.

Q. And really from that time on and thoughout the life of the system the generators are effectively controlled by the consumers in their aggregate demand?

A. They are controlled through a system of well conceived regulating devices.

Q. But the so-called output of the generators is a function entirely of the consumer's load, subject to these uses or losses?

A. The consumer's load actuates the controlling devices, and they control the generator and the turbine.

Consumers' devices at one end and generator at the other end must operate substantially integrally and synchronously in point of time to produce the desired result. [fol. 268] With respect to the uses or losses in the system, it is true that the system itself impresses on the generators

a demand similar, so far as the generators are concerned, to the demands of consumers to satisfy these uses or losses. And the generator, if you can imagine it as a sentient being, does not distinguish in performing its functions between the load that is created by the consumer and the load that is created by those so-called losses.

Meters at the generating station, or what the statute which we are considering in this case calls "The place of production" are placed outside the generators, and that is the first place at which the energy transferred through the generators may be measured.

While possibly for laboratory purposes you might measure it somewhere else, yet commercially it cannot be measured until that time.

With respect to that energy which reaches the consumers, it is all in course of transit to consumers or, in fact, is being simultaneously, for practical purposes, received by them at the time of the measurements. These meters measure the energy flowing past the point at which the meter is connected. The measurement is in terms of kilowatt hours which is the unit for measuring electrical energy.

Q. And that, of course, is a well-known mathematical expression of energy relationship—as a matter of fact, if you change the dial of the meter, you could record that measurement in horsepower?

A. By changing the calibration you could record it in any unit you pleased. In fact, you could even measure it, by proper change in calibration and expressions on the dial in British Thermal Units.

Q. Now, after all, this measurement is merely a mathematical expression of energy in a convenient form?

A. Not only mathematical, but commercial—practical.

The consumers' motors or other appliances must be de- [fol. 269] signed and adapted to the voltage of delivery of energy, so that you could not effectively use a 6600 volt motor on, we will say, a 44,000 or 130,000 volt transmission line.

Q. These motors used by consumers to reconvert the energy from electrical to mechanical form and put it to work were once called dynamos?

A. Yes. Dynamo is probably a term that is rather loosely used, but I think is generally accepted as a name for both motors and generators.

Q. We used to call generators dynamos?

A. It is something in the same situation as the term "Electricity" is used. It is quite frequently used loosely.

The construction of both generators and motors is very similar.

Q. And speaking approximately, if you had a thousand kilowatt generator at one point and a thousand kilowatt motor at another, you could operate the system in either way, by putting the prime mover back of the generator in one case, and back of the motor in the other?

A. Hardly in alternating currents. In direct currents that might work to fair advantage, but hardly in alternating currents. There is too much difference. However, the functions of the generator and of the motor are the same, namely: that they are devised for what we will term the conversion of the energy between the mechanical and the electrical forms. The process of the alternator or the generator, converts mechanical energy into electrical energy, while the motor reverses the process and converts electrical energy into mechanical energy. Neither the generator nor the motor creates energy. In fact, it is fundamental law of physics, that energy cannot be created or destroyed. That is the basis of our whole electrical engineering science.

A generator does not create electrical energy. Generation does not mean creation. It does generate voltage, and using the term in that sense, it becomes largely a matter of definition what you mean by "generator." But it does [fol. 270] not create electrical energy. It is a designation of what happens rather than a description of it.

Energy passes directly from its source through these appliances, notwithstanding the interposition of transformers or anything else, direct to its destination.

Q. It take it that there is no disagreement between yourself and Mr. Peek as to the definitions of electricity and current, as he described them?

A. No.

Q. You spoke of the storage effect of condensers?

A. Storage in the sense of having it accumulate, like water in a reservoir, is negligible, but as far as using it by rapidly storing it and taking it back again, then it need

not be negligible, and is used commercially. For example, in your capacitors' use for power factor correction by placing the condenser or capacitor, which is merely another name for the same thing, at the terminals of an induction motor the energy required to magnetize the motor will be stored in the capacitor during each half cycle, and then returned to the motor so as to eliminate the necessity of having that energy travel back and forth between the generator and motor, and for that purpose the condensers or capacitors are used to a considerable extent.

Q. Yes, but it is, however, an instantaneous charge and discharge?

A. Not instantaneous. It is 120 times a second, but that is not instantaneous. And that is what you might term a "system function"—that is, it is a part of the devices or appliances used in the system to get the energy from its source to the consumer—to insure economical operation. The flow of energy in the electrical form from the generator to consumer is direct, continuous and, essentially, simultaneous.

Q. And while I think it is probably also sufficiently covered by means of the construction of a modern electrical [fol. 271] system containing automatic regulating and controlling devices, to which you referred, the satisfaction of the consumer's demands rests with him, and the impulses set up by him, as closing a switch, without interference by the company?

A. As soon as the automatic regulating devices function in their proper manner that is true.

Q. So the furnishing of power and energy over such a system consists, so far as the company is concerned, in maintaining it at voltage and frequency, and that completes the function?

A. With all of the equipment in proper working condition. That is, if the company maintains voltage and frequency, then it is up to the consumer to get his energy.

Redirect examination.

By Mr. Barber:

We distinguish between electric energy and energy in other forms, generally as having different characteristics and manifestations.

With the proper devices, we could transport energy in the way that you can transport, say, coal and gasoline, and transform that at the place of use into light energy, or heat energy, or mechanical energy.

Q. Would you say that the entire electric system is purely a transferring device?

A. It is converting and transporting. Without that conversion of energy you could not operate the radio set in your home by mechanical energy in the turbine shaft, or the energy in the falling water.

With reference to the theory of conservation of energy, there is also a theory of indestructibility of matter.

Q. Is there any analogy between the change of energy from one form into another and the change of matter from one form into another?

A. Well, you could take water as ice and steam, and as [fol. 272] liquid water, and you still have the same material, but it is in three forms, and ice, water and steam are still the same material substance. I should think a fair analogy might be to say that energy in an electrical form or a mechanical form or heat form would similarly be energy with different characteristics.

Q. When wheat is ground into flour, is there a change in the constituency of the matter that is there?

A. No. If we have wheat and grind it into flour, and make it whole wheat flour, we are merely changing the physical properties and making it a powder instead of lumps or kernels, but still the same material is there.

Recross-examination.

By Mr. MacLane:

The coal and the gasoline contain the energy which is being transported in those cases. And the vehicle for the transportation of coal and gasoline is a railroad car in the case of coal, or in the case of gasoline, perhaps a pipe line, or something of that kind. And the vehicle for the transportation of energy electrically is the electric system. When you are transporting energy in electrical form, rather than in coal or gasoline, you use the electrical system for the agency of transporting.

WELLINGTON RUPP, a witness on behalf of the Defendant, testified:

Direct examination.

By Mr. Barber:

My name is Wellington Rupp; 36 years of age; I live at 921 First Avenue West, Seattle, Washington; Consulting engineer in electrical and civil engineering.

I graduated from the University of Washington with the degree of Bachelor of Science in Electrical Engineering, in 1921, and five years later I received the professional degree of Electrical Engineer.

From 1919 to 1921 I was a student at the University of Washington, in 1920 doing consulting engineering work in [fol. 273] Belgium and France for a period of five months. The latter part of the period at the University of Washington I was engaged as physics instructor at the University.

From 1921 to 1925 I was Assistant Engineer and from September, 1925, to January, 1928, Chief Engineer in the Department of Public Works of Washington, engaged in the investigation of the public utilities of the state of Washington.

In 1924 I was a member of the American Committee at the World Power Conference at London, England. Subsequently I studied power plants in England, Norway, Sweden, Germany, Belgium and France as a guest of these nations.

From January 15, 1928 to date, I have been engaged as a consulting engineer, during which time the work has involved investigations of telephone and electric properties as well as other civil engineering work in the State of Washington, and also a study, over a period of a year, of electric and telephone properties in Japan, Korea, Manchuria, China, Philippine Islands, Dutch East Indies, Straits Settlements, Indo-China, Siam, Burma, India, Ceylon, Egypt, Palestine and some European countries. Subsequently engaged in consulting work in Washington, Oregon and California; also in connection with investigations of utilities.

I am a member of the American Institute of Electrical Engineers; a member of the American Society of Civil Engineers, and of Tau Beta Pi, and the Society of American Military Engineers.

I am familiar with the operation, construction and employment of electrical power systems.

Q. Describe, briefly, the functions of the generator in that system.

A. The generator is employed to convert either the energy of falling water or the energy of fuels into electrical energy. I distinguish between electrical energy and other forms of energy. The mechanical energy has to be [fol. 274] changed into electric energy for use in the electrical appliances.

Q. In the electric system is that change completed at the generator?

A. There would be further changes out over the lines, at the transformers, for instance. It remains electric energy, but it is changed in characteristics.

A generator could be designed to furnish power which could be used in certain appliances. Or devices could be designed to use the power which flows from generators. In other words, transmission for a distance is not necessary.

The transformer is necessary or, at least, desirable in an electrical system to increase the voltage, because it is more economical to transmit electric energy at high voltages than at low voltages.

Q. Is the electric energy flowing from the generator to the transformer impressed with the same physical characteristics as that which flows from the transformer over the transmission lines?

A. I do not know whether I would want to say that it has the same physical characteristic. It has a different characteristic after it passes through the transformer and out on the transmission line. And it is the purpose of the transformer to give it that different characteristic.

Q. Is there any similarity between that change in the transformer and that in the generator?

A. The electrical characteristic of the method of changing is very similar, in that in each case the change resulting

from the operation involves the cutting of lines of force by the conductor, or, vice versa, the cutting of the conductor by lines of force, or the inducing of current in the conductor by the magnetic lines of force.

Q. Is there any similarity between the change in characteristics of energy which takes place in the generator, and the change in the characteristics of material matter in [fol. 275] other processes?

A. I think it would be proper to draw an analogy between the change which takes place in the energy in the generator and other processes, such as taking the cotton from the field. It is made into various forms which are useful. It might be made into calico, or it might be made into the material used in a shirt. It is taking the same material and making it into something which, due to its changed characteristics, is adapted to another use.

Q. Is the full amount of the energy which flows from the generator delivered to consumers for use?

A. No. There are certain losses between the time that it is generated and the time it is consumed. The principal loss would probably occur as a copper loss in the transmission of the energy over the line. There would be a loss—both a copper loss and a hysteresis loss in the transformers.

Q. In the electrical industry generally are these referred to as losses or uses?

A. Losses. I have always heard of it referred to as losses.

Q. Are you able to accurately measure the output of the electrical energy that comes from a generator?

A. It can be measured with practical accuracy.

Q. Can you measure accurately the amount of energy which reaches the transformers and that which flows out from the other side, and the amount delivered to any point on the line?

A. Yes. It can be measured. It is commercially practical.

Energy in the electrical form is delivered up to the point of the appliance, and then it may be converted again into different forms of energy. In the case of running a washing machine they would change it into mechanical energy, and if they were going to put it in a light they would change

it into heat energy and possibly you could say light energy. The meter measures the electrical energy, and the units usually used are kilowatt hours.

[fol. 275½] Q. Generation being accomplished by the utilization in one case of the power of falling water, and in another case by the utilization of burning fuel, there is no distinction between the kind of energy which flows from the generator in either case?

A. No. It would be exactly the same kind of energy. There are certain situations where it is more economical to generate the energy by means of water power, and there are other situations where it is more economical or more desirable to generate the power by steam, using oil or some other fuel as the heat agent.

I am not familiar with the system of the plaintiff, the Utah Power and Light Company except in a general way.

Cross-examination.

By Mr. MacLane:

Q. You referred to some analogy between the change of cotton into calico and from calico into shirts with reference to the electrical process. If you wished to describe this electrical process to a person who did not understand anything about it, you would hardly use that analogy to make it clear, would you?

A. Well, the purpose of that analogy would be to show the manner in which the characteristics are changed. I would use that analogy in showing the change in characteristics rather than describing the process.

Q. It really is not very illuminating as a description of the process, is it?

A. Not of the process, no.

I subscribe to the physical doctrine of conservation of energy.

After all, the thing that exists in nature, and the thing that the so-called consumer wants to use, is energy. We have to adapt the form of energy to our particular needs. And the electrical system is interposed between the source of the energy and the place of its desired use for the

purpose of facilitating its change in form and transfer to [fol. 276] the point of use.

Q. For illustration, if you have a waterfall you will, other things being equal, convert the energy, as you say, into electric energy at that waterfall and transmit it to the point of use, rather than to carry the water from the top of the fall for a considerable distance as mechanical energy and then dropping it through your wheels and conveying the energy at some place of use some miles distant?

A. Well, it accomplishes two purposes. It facilitates the transfer, and it facilitates the use. If I might just clarify that, in some cases it is better to use it in the form of small electrical motors, distributed around a machine shop, and only in the form of electrical energy can it be economically carried into and delivered to these various motors. So the electrical energy is useful for that purpose.

It is also a much more flexible medium for getting the energy from place to place. And if you have several places where you want to use it, as in connection with an ordinary commercial electrical system such as that of the plaintiff, it is much more economical and much more efficient to transfer it just as far as you can in the so-called electrical form than it is to attempt to take a stream of water and divide it into a hundred or a thousand parts and use those parts separately.

The generator, of course, does not generate in the sense of creating energy. It does not create energy.

It may be said to generate a state of electrical tension or voltage.

Q. It is not the voltage that the consumer wants, it is the energy?

A. Well, the energy is a combination of the voltage and the current over a period of time.

Q. The voltage, I think one of the witnesses stated, causes electricity, which is present in nature previously at rest, to be set in motion so as to permit the transfer of energy?

A. I think that it is a little bit beyond me. I believe there [fol. 277] is considerable theory involved there.

Q. You likened the transformer to a generator in certain respects in that, I believe, lines of force are cut in the transformer. That also is true in the motor?

A. That is correct, and, in fact, this path for the transfer of electric energy is not only electrical but also magnetic. And through the gaps of the transformer and the motor the energy travels, in what we may term an electromagnetic path. And these meters to which we referred measure the energy while it is in the course of such transit and also, in fact, while it is actually being delivered to the consumer.

Q. The consumer really initiates the load which is carried on the generator, doesn't he, by closing the circuit?

A. Well, it is due to his closing the switch that certain controlling apparatus is placed in operation, and that results in a variation in the operation of the generators and variation in the load on the line.

He sets up certain impulses which go back to the generator and cause certain actions to take place there—in going back to the control apparatus which controls the governor.

Q. I believe it is implied in what you stated that what the consumer uses is energy—electric energy as distinguished from electric current?

A. Well, it involves the use of the combination of the current and the voltage which use, over a period of time, is the energy.

I do not believe that I could say whether the current itself remains in the closed circuits.

Q. It is just a practical matter. If you put an ammeter on each side of a consumer's motor you would measure the same current, regardless of the intervening use of energy?

A. Yes. You would get the same flow.

Q. It is not one of the purposes of the manufacturer of the shirt out of cotton, or the intervening calico, to convert it back to its former state of being cotton again, is it?

[fol. 278] A. No. That is not the purpose.

Redirect examination.

By Mr. Barber:

Q. You have energy in falling water available to the kitchen sink, do you not?

A. Yes.

Q. Can you use that for the operation of electrical appliances and devices in the home without the operation of a generator?

A. Not without changing the form by means of a generator or some such device.

Recross-examination.

By Mr. MacLane:

Q. As a matter of fact, if you had enough water coming in to the kitchen sink you could put a little dynamo in there and convert it into electric energy right there, could you not?

A. Yes.

Mr. Barber: The defendant rests.

Mr. MacLane: The plaintiff rests.

[fol. 279] STIPULATION FOR SETTLEMENT

It is hereby stipulated by and between the parties hereto, by their counsel, that the foregoing "Statement of Evidence" is true, complete and properly prepared, and having been duly lodged within the time allowed therefor, may be settled and allowed by the Judge of the United States District Court for the District of Idaho, and filed with the Clerk of said Court for use on appeal to the Supreme Court of the United States.

Dated Feb. 15th, 1931.

Hawley & Worthwine, Merrill & Merrill, John F. MacLane, Geo. R. Corey, Solicitors for Plaintiff.
Fred J. Babcock, Sidman I. Barber, Maurice H. Greene, Solicitors for Defendants.

IN UNITED STATES DISTRICT COURT

ORDER SETTLING STATEMENT OF EVIDENCE

Pursuant to the within and foregoing stipulation of counsel, and I having examined the same and being satisfied

that the within and foregoing statement is true and properly prepared, and I having approved of the reproduction of such part of the testimony in the exact words of the witnesses as are so included in the statement,

It is therefore ordered that the same be settled and allowed as a true, complete and properly prepared statement of all evidence introduced in said cause material to the hearing of the appeal thereof, and it is hereby ordered filed as part of the record for the purpose of the appeal.

Dated Feb. 15th, 1932.

Wm. H. Sawtelle. J. Stanley Webster, Charles C. Cavanah, District Judge.

[fol. 280] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

PETITION FOR APPEAL—Filed Feb. 17, 1932

To the Hon. W. H. Sawtelle, Circuit Judge; Hon. J. Stanley Webster, and Hon. C. C. Cavanah, District Judges, sitting as a statutory court in the District of Idaho, Southern Division:

The above named plaintiff, Utah Power & Light Company, a corporation, feeling itself aggrieved by the decree dated February 8, 1932, and entered in this cause on the 15th day of February, A. D. 1932, does hereby appeal from said decree to the Supreme Court of the United States, for the reasons specified in the Assignment of Errors which is filed herewith, and it prays that its appeal be allowed and that Citation issue as provided by law, and that a transcript of the evidence, proceedings and papers upon which said decree was based, duly authenticated, may be sent to the United States Supreme Court sitting at Washington, D. C.

And your petitioner further prays that the proper Order be made and entered fixing the amount of bond and the

security required of it to perfect its appeal and as a supersedeas.

Dated, this 16th day of February, 1932.

John F. MacLane, 120 Broadway, New York City; Geo. R. Corey, Salt Lake City, Utah; Hawley & Worthwine, Boise, Idaho; Merrill & Merrill, Pocatello, Idaho, Solicitors for Plaintiff.

[fol. 281] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

ASSIGNMENT OF ERRORS AND PRAYER FOR REVERSAL—Filed Feb. 17, 1932

Now, on this 16th day of February, 1932, comes the plaintiff, to wit: Utah Power & Light Company, by its Solicitors, John F. Maclane, George R. Corey, Hawley & Worthwine and Merrill & Merrill, and having prayed for an appeal to the Supreme Court of the United States from the Decree dated February 8th, 1932, and entered in the above entitled cause on the 15th day of February, 1932, by the special Statutory Court sitting in the District Court for the District of Idaho, Southern Division, says that said decree is erroneous and unjust to the plaintiff in the following particulars, upon which it will rely upon the prosecution of its said appeal:

I

Because the Court erred in dissolving the Interlocutory Injunction heretofore granted in this cause and ordering the payment of the tax required by the Tax Act described in the Bill of Complaint and in refusing to decree a permanent injunction restraining enforcement of said Tax Act as against the plaintiff.

[fol. 282]

II

Because the said Court erred in finding and concluding that the said Tax Act was valid and in failing to find and conclude that the same was void for the reasons alleged

in plaintiff's Bill of Complaint and as specifically set forth in the following assignments.

III

Because the said Court erred in finding and concluding that the Tax Act, as applied to the plaintiff and its operations, does not impose a direct burden on interstate commerce in violation of Clause 3, Section 8, Article I, of the Constitution of the United States and in not finding and concluding that said Tax Act, as applied to the plaintiff in its operations, does impose a direct burden on interstate commerce in violation of said constitutional provision.

IV

Because said Court erred in not finding and concluding that the Tax Act violates the Fourteenth Amendment of the Constitution of the United States and Section 3, Article I, of the Constitution of Idaho, in that Section 5 of said Act compels the appropriation and payment of money by the plaintiff for the sole and exclusive benefit of private individuals without compensation of the plaintiff therefor.

V

Because said Court erred in not finding and concluding that said Tax Act violates Section 2 of Article VIII and Section 2 of Article VII of the Constitution of Idaho in that said Tax Act constitutes the levying of a tax for other than a public purpose, to wit: for the benefit of individuals who use electrical energy for the pumping of waters for irrigation purposes on lands in the State of Idaho.

[fol. 282½]

VI

Because said Court erred in not finding and concluding that the Tax Act violates Section 6 of Article VII of the Constitution of Idaho, in that it imposes a tax for the benefit of a municipal corporation, to wit: an irrigation district.

VII

Because said Court erred in not finding and concluding that the Tax Act violates the Fourteenth Amendment of the Constitution of the United States in that it denies the

plaintiff, engaged in the business of generating or producing electricity or electrical energy in the State of Idaho, equal protection of the laws, and deprives the plaintiff of its property without due process of law and likewise violates Section 13, Article I, of the Constitution of Idaho, in that the plaintiff is deprived of its property without due process of law.

VIII

Because the said Court erred in not finding and concluding that the Tax Act violates Article III, Section 16 of the Constitution of Idaho, which provides that every Act shall embrace but one subject and matters properly connected therewith which subject shall be expressed in the title.

IX

Because said Court erred in not finding and concluding that the subject of the Act is not expressed in the title and that the title is deceptive in that the title purports to levy a license tax on electricity and electrical energy generated, manufactured and produced in the State of Idaho for barter, sale or exchange, whereas the Act purports to levy [fol. 283] a tax upon the producer of electrical energy for barter, sale or exchange and a tax on such energy generated or manufactured by him, and as such further violates Article III, Section 16 of the Constitution of Idaho.

X

Because the Court erred in not finding and concluding that the subject of the Act is not expressed in the title in that the title provides that there shall be exempted from the tax the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho, whereas the Act provides that the full amount of such license tax which would have been due from such producer of electricity shall be so exempt, and as such further violates Article III, Section 16 of the Constitution of Idaho.

XI

Because the Court erred in not finding and concluding that said Tax Act was either (a) a license tax, and as such

constitutes a second license tax imposed in the same year for the same purpose in violation of Article VII, Section 2 of the Constitution of Idaho, or (b) a property tax levied on the kilowatt hour as property and as such violates Article VII, Section 2 of the Constitution of Idaho, which requires a tax to be levied according to valuation, and Article VII, Section 5 of the Constitution of Idaho, which requires such taxes to be uniform.

XII

Because the Court erred in not finding and concluding that the Extraordinary Session of the Legislature of Idaho, at which said Tax Act was passed, was called in violation of Section 9, Article IV of the Constitution of Idaho, for the reasons alleged in Subdivision E of Paragraph 15 of the Bill of Complaint.

[fol. 284]

XIII

Because the Court erred in not finding and concluding that said Tax Act is void and unenforcible for the various uncertainties and ambiguities alleged in the Bill of Complaint, and that the enforcement thereof would constitute taking plaintiff's property without due process of law in violation of the Fourteenth Amendment of the Constitution of the United States.

XIV

Because the said Court erred in making the following Findings of Fact:

(a) That portion of Finding No. II to the effect that "it is a matter of speculation as to where markets will exist in the future for the electrical energy generated by the plaintiff at its said Idaho stations".

(b) That portion of Finding No. V to the effect that "Electrical energy so generated is energy with new and different physical characteristics and new and different uses than energy in other forms" and that the "electrical energy so produced is in the process of generation given certain definite characteristics with reference to voltage, frequency and its character as direct or alternating current as desired and as required by the needs of the customers or the char-

acter of the system"; and that "these characteristics are variable according to the character of the machinery employed"; and that "the process of conversion of energy in the electrical form is completed at the generator before the pulses of energy leave the generator in their flow to the station bus or transformer"; and that "the amount of electrical energy so generated and measured is substantially greater than the amount which plaintiff may deliver to Utah or to any distant point by reason of losses occurring in the subsequent process of transforming the flow of energy to [fol. 285] a different current or voltage in order to transmission, and in and from the transmission line"; and that "the kilowatt-hour is a unit of measurement of a definite physical entity, and of a commercial commodity produced by the plaintiff for transmission, delivery and sale to its customers and/or purchased by the plaintiff from other producers for such transmission, delivery and sale by the plaintiff"; and that "it (the kilowatt-hour) is not the measure of a period of time nor of service".

(c) Further that portion of Finding No. V to the effect that "the transformers are interposed to produce a different current and higher voltage"; and that "such changes in the physical characteristics of the flow of energy from the generator and the production of a separate current are required in order to aid in preparation for transmission and that the same are substantial in character, in that electrical devices or appliances designed to function with the current and voltage at which plaintiff generates would not function with the current and voltage at which the energy flows from the transformer"; and that "similarly, the current and voltage transmitted is not in most instances delivered to the consumer but by the interposition of other transformers, a separate current of lower voltage than that transmitted (and of lower voltage than that produced at the generator) is induced in the transformer coils connected with the distribution lines and delivered to consumers"; and that "such process is necessary in order to the utilization of those devices and appliances used by consumers of electrical energy".

(d) Further that portion of Finding No. V to the effect that "the court finds that it is not true that the system of the plaintiff is purely a transferring device; but that the

[fol. 286] primary and essential function of the generator is to convert energy from the mechanical into the electrical form and to produce an electrical current, and that the primary and essential function of the transformer is to prepare the energy flow for transmission through the induction of a new and separate current of higher voltage which may be economically transmitted"; and that "the consumer receives and must receive both current and power; and that the measurement of electrical power generated and delivered to the consumer is the product of current and voltage. The original source of both electric power and electric current is in the generator.

(e) That portion of Finding No. VI to the effect that "as to each of such stations (stations in Idaho) a use of water is had and enjoyed by plaintiff under permit and license of the State of Idaho"; and that "the electrical energy so obtained by utilization of such power of falling water is in all respects identical with the electrical energy obtained through the utilization of power of burning fuel."

And the making of each of said findings and portions of findings is separately and severally assigned as error.

XV

Because the said Court erred in the following Conclusions of Law:

(a) That said Tax Act does not violate the Fourteenth Amendment of the Constitution of the United States in that it does not deny the plaintiff, engaged in the business of generating or producing electricity and electrical energy in the State of Idaho, equal protection of the laws and does not render its property liable to be taken without due process of law.

[fol. 287] (b) That said Tax Act does not violate the Fourteenth Amendment in that Section 5 does not compel the appropriation and payment of money for the benefit of private individuals.

(c) That said Tax Act does not violate Article III, Section 16, of the Constitution of the State of Idaho, which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall

be expressed in the title in that the provisions of said Act are in each necessary particular expressed in the title, and said Act embraces but one subject.

(d) That said Tax Act does not violate Section 13 of Article I of the Constitution of the State of Idaho, in that the plaintiff is not deprived of its property without due process of law.

(e) That said Tax Act does not violate Section 2 of Article VIII and Section 2 of Article VII of the Constitution of the State of Idaho in that said Tax Act does not constitute the levying of a tax for other than a public purpose nor constitute the levying of a tax for the benefit of an individual.

(f) That said Tax Act does not violate Section 6 of Article VII of the Constitution of the State of Idaho in that it does not impose a tax for the benefit of a municipal corporation, to wit: an irrigation district.

(g) That said Tax Act does not constitute a violation of Section 2 of Article VII of the Constitution of the State of Idaho, and that it does not impose a double license tax for the same purpose, in that said Tax Act imposes an excise tax upon the producer of electrical energy for barter, [fol. 288] sale or exchange; whereas the license tax imposed upon plaintiff is a corporate franchise tax for the privilege of existing and doing business in the State as a corporate entity.

(h) That said Tax Act does not violate Section 2 of Article VII of the Constitution of the State of Idaho in failing to provide for the levying of the tax according to valuation, nor Section 5 of Article VII in that it does not provide for the levying of a uniform tax upon the same class of subjects within the territorial limits of the authority levying the tax, nor constitute double taxation, in that said tax is not a property tax but an excise tax.

(i) That said Tax Act does not violate the provisions of Section 9 of Article IV of the Constitution of the State of Idaho, in that the determination of the Governor as to whether or not an extraordinary occasion exists for the calling of the special session of the Legislature is conclusive upon the courts.

(j) That said Tax Act is not void for uncertainties.

(k) That said Tax Act does not violate Clause 3, Section 8, Article I of the Constitution of the United States in that it does not impose a burden upon any act of interstate commerce, that the generation of electrical energy by plaintiff's generation stations is an act of intrastate commerce.

(l) That the defendants are entitled to a decree dissolving the interlocutory injunction heretofore issued in said cause, and requiring the plaintiff to pay the accumulated tax with interest and costs, but without penalties during the pendency of this action.

And the making of each of said Conclusions is separately and severally assigned as error.

[fol. 289] XVI

Because the Court erred in failing to make the following Findings of Fact requested by the plaintiff, to wit:

(a) Finding No. II to the effect that plaintiff's system is operated as a unit, whereby energy in the electrical form is generated, transmitted, distributed and delivered in barter, sale or exchange, to its customers in Idaho, Utah and Wyoming and in interstate commerce; that the generation and transmission of said electrical energy from the State of Idaho to the States of Utah and Wyoming was sold to customers in said States and such generation and transmission was necessary for the performance of Plaintiff's contracts with customers in said States; that the local customers uses in Idaho have been connected to the Idaho generating stations merely to gain economy and service convenience, which, except for these major stations, would be impracticable.

(b) Finding No. III to the effect that plaintiff's "Bear River System" was constructed primarily for the purpose of generating electricity for use in the State of Utah, and that since its construction it has been used almost solely for the purpose of generating electricity which passes without interruption from the Idaho plants on the Bear River to consumers in Utah and Wyoming and substantially all the patrons of the plaintiff who use electricity from these

plants do so under contracts with the plaintiff, which contracts are made and fulfilled outside the State of Idaho.

(c) Plaintiff's proposed Finding No. VI to the effect that the tax imposed by said Tax Act is a license tax upon the producer and no provision is made in said Act for measuring and computing separately the amount of the tax as applied to such electricity as might be used in Idaho [fol. 290] as distinguished from that used in Utah and Wyoming; that plaintiff cannot withdraw from or discontinue its Idaho business.

(d) Finding No. VII to the effect that the various electrical facilities used by the plaintiff in generation and transmission of electrical energy are purely transferring devises, the entire combined process—electric, magnetic and mechanical—is integral, continuous and essentially simultaneous, as electricity travels with the speed of light, one hundred eighty-six thousand miles per second of time.

(e) Finding No. VIII to the effect that there is a continuous electrical and electro-magnetic path between the windings in the generator and the windings in the consumer's motor (or between the generator windings and the filament in an electric lamp or the electrodes in an electro-chemical cell; that the entire electric system is a device for transferring the force (as of falling water) to, and applying it at the point where it is to be utilized.

(f) Finding No. IX to the effect that in the case of the plaintiff's system "electricity and electrical energy", described in the Tax Act, is "generated, manufactured or produced" only if, as and when the com-ined demand of its customers in Utah and Wyoming causes the turbine gates of the Idaho generating stations to open, thus permitting the energy of the falling water exerted within the turbine to be instantly transferred through the electric generator and other parts of the interstate electric system to the customers' motors, lights or other equipment; that each customer's demand occurs just as and when the customer desires, and is effected by his act of switching on lights, motors, ranges and other electrical appliances; that [fol. 291] as the demand is made, the electricity demanded

is instantly, and as an immediate and direct result of said demand, generated at plaintiff's said stations specifically and solely for, and in response to, that demand and use; and that the demands of the plaintiff's various customers in Utah and Wyoming occur on various secondary transmission and distribution lines in said States, which demands are brought partially together through local facilities and completely consolidated at Terminal Station near Salt Lake City, Utah; that there is thus created a continuous combined demand on the Idaho generating stations which exists throughout the Utah-Idaho-Wyoming system; that this combined demand automatically manifests itself on the various generating stations in Idaho, which have been previously placed in readiness for service without point of rest between generation and Terminal Station.

(g) Finding No. X to the effect that the entire process of generation, transmission and use of electrical energy on the plaintiff's system is a continuous, inseparable transfer of energy from the falling water, through the generators, transformers, along the transmission lines, to the customers' points of use in Utah and Wyoming, the transfer of which electrical energy is at the rate of speed of approximately one hundred eighty-six thousand miles per second of time.

(h) Finding No. XI to the effect that there is an absolute interdependence of the consuming devices upon the generator and there can be no generation of electrical energy upon the plaintiff's system except as and to the extent that [fol. 292] such energy is called for and used at the final point of utilization other than that absolutely necessary to hold the electric generator under constant rotation and electric charge in instant readiness to serve.

(i) Finding No. XII to the effect that the difference in amount of electricity generated and that actually used by the consumer constitutes line uses and is necessary and essential in the process of generating, transmitting and using electricity.

(j) Finding No. XIII to the effect that the electrical energy or "kilowatt-hours" produced or generated upon plaintiff's system and in the plaintiff's generators cannot

be stored or reservoired or detained, but is used by the consumer instantly with its generation; that there is no point between generation and use of said electrical energy where the same is detained or brought to rest.

(k) Finding No. XIV to the effect that the power being transferred at any instant along the electric circuit existing between an electric generator at one place and a receiving device at another place is calculable at any point in the circuit from the electrical pressure or voltage between wires and the magnitude and characteristics of the electric current circulating in the wires and is commonly expressed in kilowatts.

(l) Finding No. XV to the effect that the "kilowatt-hour", the usual unit for measuring electricity in the electrical form, is a mathematical product of the power relation in the electric circuit between a generating and receiving device, measured in kilowatts, and the duration of time over which that relation is utilized measured in hours.

[fol. 293] (m) Finding No. XVI to the effect that the "recording watt hour meter or meters, or other suitable instrument for measuring the electricity or electrical energy produced," which is required by said Tax Act to be maintained, "at the point or points of production" on the plaintiff's inter-connected Idaho-Utah-Wyoming system will record, expressed in terms of kilowatt-hours, the mathematical product of the power relation of the electric circuit between the generator of said system in Idaho and the receiving devices in Utah and Wyoming (as their demands are combined at Terminal Station), measured in kilowatts, and the duration of time over which that relation is utilized, measured in hours, including in the measurement, the energy expended in the system, to meet losses and other necessary uses incident to the delivery of energy to such receiving devices.

(n) Finding No. XVII to the effect that the measurement of electrical energy upon which the tax is sought to be imposed by said Tax Act is, and will be, a direct measure of the magnitude and duration of interstate commerce in electrical energy over said system after said commerce has commenced and during the course thereof.

(o) Finding No. XVIII to the effect that the generation of electricity is not the production of a commodity or material thing; it is a part of the process of rendering a service, and no electricity can be commercially generated or produced except as an inseparable part of the service rendered; likewise the "kilowatt-hour" is the measure of such service and not a measure or unit of material thing.

[fol. 294] (p) Finding No. XIX to the effect that there is a marked distinction between electric current and electrical energy or power; that electric current is the carrier for electric power or energy; that electric current is not used or consumed by the consumer but returns again to the generator, leaving behind electric energy or power which is used or consumed by the consumer; that electric current is never bought or sold; that it is electrical energy which is purchased by the consumer; that electric current is measured in amperes, while electric energy is measured in kilowatt-hours—two distinct quantities, not convertible into each other, nor expressible in terms of each other.

(q) Finding No. XX to the effect that the function of a transformer in a hydro-electric system, like that of the plaintiff, is to transform current and voltage such as to give it higher or lower pressure; that it does not in any respect affect or change the power or electric energy; that its use is purely an economic one; that it plays a role similar to that of a set of reduction gears and affects solely the electric current, while the same electrical energy or power which comes from the generator passes through the transformer without change in its physical or other characteristics and that energy which is purchased and used by the consumer is the same energy which leaves the generator and passes through the transformer, along the transmission lines to the consumer's device.

(r) Finding No. XXI to the effect that electrical energy, which is required to be measured by said Tax Act in terms of kilowatt-hours, is precisely the same energy whether it is measured after it leaves the generator or before it enters [fol. 295] the transformer, or measured at any other place along the transmission line between the generator and consumer's device and said measurement cannot be made at

any point except as and when the electrical energy is in motion and passing to its destination.

(s) Finding No. XXII to the effect that generation, transmission and use of electrical energy is an integral, inseparable process and this process is inseparably connected with the fulfillment of contracts for service between the plaintiff and its various customers in Utah, Wyoming and Idaho; that the Tax Act considered in this case cannot operate as against the plaintiff except that it burdens the commerce in electrical energy between the States of Utah, Idaho and Wyoming.

(t) Finding No. XXIV to the effect that Section 5 of said Tax Act compels an appropriation and payment of money of the plaintiff for the sole and exclusive benefit of private individuals and corporations, to wit: Those using electrical energy for pumping water for irrigation purposes, without compensation to the plaintiff therefor; that the effect of the Act is different as Section 5 is held to be valid or invalid and that Section 5 is, therefore, inseparable from the balance of the Act and the Court cannot determine from the Act whether or not it would have been passed by the Legislature had said Section 5 not been included therein.

(u) Finding No. XXV with respect to the issues raised by Paragraph XV of the Bill of Complaint and the Amended Answer thereto, to the effect that:

A

[fol. 295½] 1. Both the title and the Act contain two subjects that is (a) the levying of a license tax for revenue purposes; and (b) the application of credits on electric bills of certain consumers of electricity.

2. That the subject of the Act is not expressed in the title in that the title purports to levy "a license tax of one-half mill per kilowatt-hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange," whereas the Act purports to levy upon the producer of electrical energy for barter, sale or exchange a tax upon one-half mill on all kilowatt-hours generated, manufactured or produced; that

plaintiff has generated and will continue to generate electrical energy substantially in excess of that generated for barter, sale or exchange, and the tax sought to be levied in the Act is, therefore, substantially different and greater than that expressed in the title;

3. That the subject of the Act is not expressed in the title in that the title provides that there shall be exempted from the tax "the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho," whereas the Act provides "that the full amount of such license tax which would have been due from the producer of electricity" shall be so exempt; that these quantities are entirely different in that the energy "actually used" is substantially less than the energy taxable at "place of production."

4. That the title of the Act is deceptive in that the subject matter of the Act is not expressed in the title.

B

[fol. 296] That the Act in exempting from the tax the electricity and electrical energy "used for pumping water for irrigation purposes to be used on lands in the State of Idaho" and providing that a sum equal to the tax that would otherwise be paid by the producer shall be paid to the consumer, constitutes the levying of a tax for other than a public purpose, to wit: A tax for the benefit of an individual, and furthermore imposes a tax for the benefit of municipal corporations, to wit, irrigation districts which pump water by means of electricity supplied by the plaintiff for irrigation purposes.

C

That said Tax is a license tax and constitutes a second license tax imposed in the same year for the same purpose in that the plaintiff has heretofore been required to pay a license tax as provided by statutes of the State of Idaho heretofore enacted by said State, the payment of which tax is conditioned upon plaintiff's right to do business in the State as a corporation.

D

That the tax imposed, or attempted to be imposed by the Tax Act, is a license tax, or in lieu thereof that said tax be definitely described and defined.

E

That the Extraordinary Session of the Legislature of Idaho, at which said Act was passed, convened pursuant to a call made prior to the adjournment of the Regular Session of the Legislature, and for the purpose of considering matters that had theretofore been considered at the [fol. 297] Regular Session of said Legislature; that said Regular Session had made all appropriations necessary for the ensuing biennium and had levied a general ad valorem tax sufficient to meet all expenses of the Government of said State for said biennium and that no extraordinary occasion existed justifying the calling of the Extraordinary Session of the Legislature of said State.

(v) Finding No. XXVI to the effect that said Tax Act is uncertain and ambiguous in the particulars alleged in Plaintiff's Bill of Complaint and as particularly set out in detail in said proposed Finding No. XXVI.

(w) Finding No. XXVII to the effect that the Tax Act is levied upon the producer of electrical energy measured but that energy produced for barter, sale or exchange, exclusive of energy used by the plaintiff for its various uses, including station uses, and also exclusive of transmission or line uses; that the measure of said tax is that energy actually sold or delivered to the customer or consumer for compensation.

(x) Finding No. XXVIII to the effect that except for this suit the defendants will attempt to enforce through appropriate action the fines and penalties prescribed in the Tax Act; that such action would result in a multiplicity of suits; that the penalties are so unreasonable, burdensome and excessive that plaintiff could not safely refuse to pay the tax without instituting this action and that there is no provision of the statutes of Idaho under which plaintiff could pay the tax under protest and recover back the amount so paid, but any payment so made would be credited

to the general fund of the State and its reimbursement [fol. 298] could not be effected except through a subsequent Act of the Legislature.

And failure to make each of said Findings is separately and severally hereby assigned as error.

XVII

Because the said Court erred in failing to make the following Conclusions of Law requested by the plaintiff:

(a) That the plaintiff is entitled to maintain this suit for injunctive relief to test the validity of said Tax Act.

(b) That said Tax Act violates the Fourteenth Amendment of the Constitution of the United States in that Section 5 of said Act compels the appropriation and payment of money by the plaintiff for the sole and exclusive benefit of private individuals without compensation to the plaintiff therefor.

(c) That said Section 5 cannot be eliminated from said Tax Act without destroying the entire Act.

(d) That said Tax Act violates Article III, Section 16, of the Constitution of the State of Idaho, which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title in that:

(1) Both title and act contain two subjects, viz., (a) levying a tax for revenue purposes and (b) the application of credits on the electric bills of certain consumers of electricity.

(2) The subject of the Act is not expressed in the title in that the title purports to levy a tax on electricity generated for barter, sale or exchange, whereas, the Act purports to levy the tax upon the producer of electricity for barter, sale or exchange on all electricity generated by such producer.

[fol. 299] (3) The subject of the Act is not expressed in the title in that the title exempts from the tax electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho, whereas, the Act pro-

vides that the full account of such tax which would have been due from the producer shall be exempt.

(e) That said Tax Act, in exempting therefrom the tax on electrical energy "used for pumping water for irrigation purposes to be used on land in the State of Idaho" and providing that a sum equal to the tax that would otherwise be paid by the producer shall be paid to the consumer, is void because it violates the following provisions of the Constitution of the State of Idaho, to wit:

(1) Section 13 of Article I of said Constitution, which provides that no person shall be deprived of property without due process of law.

(2) It constitutes the levying of a tax for other than a public purpose, to wit: for the benefit of an individual in violation of Article VIII, Section 2, and Article VII, Section 2 of said Constitution.

(3) It imposes a tax for the benefit of municipal corporations, to wit: irrigation districts which pump water by means of electricity supplied by the plaintiff for irrigation purposes, in violation of Article VII, Section 6, of said Constitution, which provides that the Legislature shall not impose taxes for the purposes of municipal corporations.

(f) That said Tax Act constitutes a violation of Section 2 of Article VII of the Constitution of the State of Idaho, in that it imposes a double license tax and fails to provide for the levying of the tax according to valuation; the tax violates Section 5 of Article VII of the Constitution of the State of Idaho, in that it fails to levy a uniform tax on same class of subjects within the territorial limits of said State.

[fol. 300] (g) That said Tax Act violates the provisions of Section 9 of Article IV of the Constitution of the State of Idaho in that at the time the Extraordinary Session of the Legislature was called no extraordinary occasion existed for calling said session.

(h) That said Tax Act is further void for the uncertainties and ambiguities recited in these Findings, which cannot be harmonized and construed together.

(i) That said Tax Act violates Clause 3, Section 8, Article I, of the Constitution of the United States, in that it imposes a direct burden upon the interstate commerce conducted and engaged in by the plaintiff in the generation, transmission, sale and use of electrical energy.

(j) That it is impossible to segregate the tax attempted to be imposed by said Tax Act and measured by the intrastate business done by the plaintiff from that measured by the intersate business done by said plaintiff; that said Tax Act, in attempting to impose a tax upon interstate business, is void as to such business, and, because of its inseparability from intrastate business, is void in its entirety as the same applies to this plaintiff.

(k) That the plaintiff is entitled to a decree declaring said Tax Act unconstitutional and void, and for a permanent injunction perpetually restraining the defendants from enforcing the same.

[fol. 301] And error is separately and severally assigned on the refusal to make each of said conclusions.

XVIII

Because the evidence as a whole and particularly that evidence showing the process of generation, transmission and use of electrical energy upon the plaintiff's system and the manner and method of plaintiff's operation in the generation, transmission and sale of electrical energy in and between the States of Idaho, Utah and Wyoming failed to support the Findings of Fact made and entered by the Court and the Conclusions of Law drawn therefrom and the Decree based thereon but require the Findings proposed by the plaintiff and the Conclusions of Law and Decree requested by it.

Prayer for Reversal

Wherefore, for the errors aforesaid, the plaintiff, Utah Power & Light Company, a corporation, prays that the said Decree of the United States District Court for the District of Idaho, Southern Division, dated on the 8th day of February, 1932, and filed in the above entitled cause on the 15th day of February, 1932, be reversed and that said

District Court be directed to enter Decree in favor of the plaintiff as prayed for in its Bill of Complaint, and for costs.

Dated this 16th day of February, 1932, and filed with Plaintiff's Petition for Appeal.

John F. MacLane, Geo. R. Corey; Hawley & Worthwine, Merrill & Merrill, Solicitors for Plaintiff.

[fol. 302] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT, DISTRICT OF IDAHO, SOUTHERN DIVISION

In Equity. No. 1621

UTAH POWER & LIGHT COMPANY, a Corporation, Plaintiff,

against

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and Fred J. Babcock, Attorney General of the State of Idaho, Defendants

ORDER ALLOWING APPEAL—Filed Feb. 17, 1932

The Utah Power & Light Company, a corporation, plaintiff and appellant in the above entitled suit, having prayed for the allowance of an appeal in this cause to the Supreme Court of the United States from the decree dated February 8th, 1932, and entered on the 15th day of February, 1932, in the above entitled suit by the United States District Court for the District of Idaho, Southern Division, with Hon. W. H. Sawtelle, Circuit Judge, and Hon. J. Stanley Webster and Hon. Charles C. Cavanah assembled as a three judge statutory court, and from each and every part of said decree, and having presented and filed its Petition for Appeal, Assignment of Errors, and Prayer for Reversal, pursuant to the Statutes and the rules of the Supreme Court of the United States in such case made and provided:

It is now here ordered that an appeal be, and the same is hereby allowed to the Supreme Court of the United States from the District Court of the United States for the District of Idaho, Southern Division, in this cause, as provided by

law, and it is further ordered that the Clerk of the Court appealed from shall prepare and certify copy of the Transcript of the Record, testimony, exhibits, stipulations, findings, decree and all proceedings in this cause, and transmit [fols. 303-307] the same to the Supreme Court of the United States, so that he shall have the same in said Court within sixty days of this date.

It is further ordered that the Interlocutory Injunction heretofore granted herein remain in force and effect pending appeal upon plaintiff giving bond in the sum of $82,500.00 with proper surety or sureties, to be approved by the Court, and that said bond act as a bond for cost on this appeal and as a supersedeas.

Dated this 16th day of February, 1932.

Charles C. Cavanah, Judge United States District Court, District of Idaho.

[fol. 308] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

STIPULATION IN LIEU OF PRÆCIPE—Filed Feb. 17, 1932

It is hereby stipulated and decreed by and between the above named parties, through their Solicitors of record, that in lieu of the filing of a Præcipe and counter præcipe herein that the following portions of the record shall be included in the transcript of the above entitled cause to be transmitted by the Clerk of the above entitled Court to the clerk of the Supreme Court of the United States, to wit:

1. Bill of Complaint.
2. Application for Interlocutory Injunction.
3. Subpœna ad Respondendum and return thereon.
4. Notice of Hearing of Application for Interlocutory Injunction and Order of Court with Return of Service on defendants and upon C. Ben Ross, Governor, State of Idaho.
5. Motion to dismiss.
6. Order denying Motion to dismiss.
6a. Minute entry of July 2, 1931.

[fol. 309] 7. Opinion of Court entered August 20, 1931, reported 52 Fed. (2d) 226.

8. Interlocutory Injunction.

9. Stipulation as to right of defendants to file Amended Answer.

10. Amended Answer.

11. Opinion entered December 30, 1931.

12. Motion of Plaintiff to Make and Enter Findings of Fact and Conclusions of Law with ruling of Court thereon.

13. Exceptions of Plaintiff to Refusal of Court to Make and Enter Findings of Fact and Conclusions of Law Proposed By Plaintiff and Exceptions To Findings and Conclusions Made and Entered and Decree Thereon.

14. Order Allowing Exceptions.

15. Findings of Fact and Conclusions of Law.

16. Decree.

17. Supersedeas Order.

18. Transcript of Evidence Settled and Allowed February 15, 1932 and fifty copies of Diagrammatic Map.

19. Petition for Appeal.

20. Assignment of Errors and Prayer for Reversal.

21. Order Allowing Appeal.

22. Copy of Bond on Appeal and Supersedeas.

23. Citation and Admission of Service.

24. This Stipulation.

It is further stipulated that paragraphs numbered one to twenty-four, inclusive, of "Exceptions of Plaintiff to Refusal of Court to Make and Enter Findings of Fact and Conclusions of Law Proposed by Plaintiff and Exceptions to Findings and Conclusions Made and Entered and Decree Thereon," which exceptions were duly allowed, are exceptions taken by the plaintiff to the refusal of the Court to make and enter Findings of Fact tendered by it and specif-
[fols. 310 & 311] ically recited in paragraph No. XVI of the Assignment of Errors and such exceptions are sufficient to present for review all matters assigned as error in paragraph No. XVI of said Assignment of Errors and to avoid repetition and shorten the printed record, paragraphs one to twenty-four, inclusive, of said "Exceptions" etc. may be omitted from the printed record and said Assignment reviewed with like effect as if said paragraphs one to twenty-four were printed at length.

It is further stipulated that there will be no counter præcipe by the defendants and appellees, and that the clerk of the above entitled Court may forthwith and without delay certify and transmit to the Supreme Court of the United States a transcript of the record as herein stipulated.

Dated this 17th day of February, 1932.

Hawley & Worthwine, Merrill & Merrill, John F. MacLane, Geo. R. Corey, Solicitors for Plaintiff.
Fred J. Babcock, Sidman I. Barber, Maurice H. Greene, Solicitors for Defendants.

[fol. 312] IN SUPREME COURT OF THE UNITED STATES

STATEMENT OF POINTS TO BE RELIED UPON AND DESIGNATION OF PARTS OF THE RECORD TO BE PRINTED—Filed Feb. 23, 1932

Comes now the appellant in the above entitled cause, and states that the Points upon which it intends to rely in this Court, in this case, are as follows:

Point I

That the special statutory court, sitting in the District Court for the District of Idaho, Southern Division, (hereinafter referred to as the court), erred in dismissing appellant's Bill of Complaint, dissolving the Interlocutory Injunction theretofore issued, ordering payment of the tax required bythe Tax Act described in the Bill of Complaint, and in refusing to decree a permanent injunction restraining enforcement of said Tax Act, as against the appellant, the specific grounds of such error being hereinafter stated (Assignment of Error No. I).

[fol. 313] Point II

The Court erred in finding and concluding that the Tax Act, as applied to the appellant and its operations, does not impose a direct burden on interstate commerce, in violation of Clause 3, Section 8, Article I of the Constitution of the United States (Assignment of Error No. III).

In the presentation and argument of this Point, appellant specifically relies upon and will present to the Supreme Court, the errors in the Findings of Fact and Conclusions of Law, the making of which is assigned as error in Paragraphs Numbered XIV, and XV Subdiv. k, of the Assignment of Errors, and the failure and refusal of the Court (the special statutory court, as aforesaid) to make the Findings of Fact and Conclusions of Law requested by the appellant in its motion therefor, such failures and refusals being specifically set forth in Paragraphs Numbered XVI Subdivisions a to s inclusive, and XVII Subdiv. i, and XXVIII of the Assignment of Errors.

And appellant adopts said paragraphs of said Assignment of Errors, and each subdivision thereof, as a part of this Point, or as sub-points hereunder, as though the same were set forth at length herein.

Point III

The Court erred in not finding and concluding that the Tax Act denies appellant equal protection of the laws and deprives appellant of its property without due process of law, in violation of the Fourteenth Amendment of the Constitution of the United States, and also Section 13 of Article I of the Constitution of the State of Idaho, in that Section [fol. 314] 5 of said Act compels the appropriation and payment of money by appellant for the sole and exclusive benefit of private individuals without compensation to appellant therefor (Assignment of Errors Numbered IV and VII).

In the presentation and argument of this Point appellant further relies upon and will present to the Supreme Court the errors in the Conclusions of Law, the making of which is assigned as error in Paragraph Numbered XV Subdivisions a, b and d, of the Assignment of Errors, and the failure and refusal of the Court to make the Findings of Fact and Conclusions of Law on this point requested by appellant in its Motion therefor, such failures and refusals being specifically set forth in Paragraphs Numbered XVI, Subdivision t, and XVII, Sudivisions b, c and e, of the Assignment of Errors.

And the Appellant adopts said paragraphs of said Assignment of Errors and each subdivision thereof as part of this Point or as sub-points hereunder as though the same were set forth at length herein.

Point IV

That the Court erred in not finding and concluding that the Tax Act violates Section 2 of Article VIII, and Section 2 of Article VII of the Constitution of the State of Idaho, in that said Tax Act constitutes the levying of a tax for other than a public purpose, to wit: for the benefit of an individual (Assignment of Error No. V). The Court also erred in not finding and concluding that the Tax Act violates [fol. 315] Section 6 of Article VII of the Constitution of the State of Idaho in that it imposes a tax for the benefit of municipal corporations, to wit: irrigation districts (Assignment of Error No. VI).

In the presentation and argument of this Point, appellant herein further relies upon and will present to the Supreme Court, the Errors in the Conclusions of Law, the making of which is assigned as error in Paragraph No. XV, Subdivisions e, f, g and h, of the Assignment of Errors, and the failure and refusal of the Court to make the Findings of Fact and Conclusions of Law on this Point requested by the appellant in its Motion therefor, such failures and refusals being specifically set forth in Paragraphs Numbered XVI, Subdiv. t, and Subdiv. u B, and XVII, Subdiv. e, of the Assignment of Errors.

And Appellant adopts said paragraphs of said Assignment of Errors and the Subdivisions thereof as a part of this Point, or as sub-points hereunder, as though the same were set forth at length herein.

Point V

That the Court erred in not finding and concluding that the Tax Act violates Section 16 of Article III of the Constitution of the State of Idaho, which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title (Assignment of Error Numbered VIII, IX and X).

In the presentation and argument of this Point, appellant further relies upon and will present to the Supreme Court, the Errors in the Conclusions of Law, the making of which [fol. 316] is assigned as error in Paragraph Numbered XV, Subdiv. c, of Assignment of Errors, and the failure and refusal of the Court to make the Findings of Fact and Conclusions of Law requested by appellant in its Motion there-

for, such failures and refusals being specifically set forth in Paragraphs Numbered XVI, Subdiv. u A, and XVII, Subdiv. d, of the Assignment of Errors.

And appellant adopts said Paragraph of said Assignment of Errors and each subdivision thereof as a part of this Point, or as sub-points hereunder, as though the same were set forth at length herein.

Point VI

That the Court erred in not finding and concluding that the Tax Act is void and unenforcible for the various uncertainties and ambiguities alleged in the Bill of Complaint, and that the enforcement thereof would constitute taking plaintiff's property without due process of law, in violation of the Fourteenth Amendment of the Constitution of the United States (Assignment of Error No. XIII).

In the presentation and argument of this Point, appellant further relies upon, and will present to the Supreme Court, the error in the Conclusion of Law, the making of which is assigned as error in Paragraph No. XV, Subdiv. j, of the Assignment of Errors, and the failure and refusal of the Court to make the Findings of Fact and Conclusions of Law on this Point requested by appellant in its Motion therefor, such failures and refusals being specifically set forth in Paragraphs Numbered XVI, Subdivisions v and w, and XVII, Subdiv. h, of the Assignment of Errors.

[fol. 317] And appellant adopts said Paragraphs of said Assignment of Errors and each subdivision thereof as a part of this Point, or as sub-points hereunder, as though the same were set forth at length herein.

Point VII

That the Court erred in not finding said Tax Act void, as applied to the plaintiff and its operations, for each of the reasons herein recited, and in not also finding and concluding that Section 5 of said Tax Act cannot be eliminated from said Tax Act without destroying the entire Act, and that it is impossible to segregate the tax attempted to be imposed by the said Tax Act and measured by the intrastate business done by the appellant from that measured by the interstate business done by the appellant, and that

said Tax Act, because of the inseparability of the intrastate business and the interstate business, is void in toto.

Point VIII

The evidence as a whole, and particularly that evidence showing the process of generation, transmission and use of electrical energy upon the appellant's system and the manner and method of appellant's operations in the generation, transmission and sale of electrical energy in and between the States of Idaho, Utah and Wyoming, fails to support the Findings of Fact made and entered by the Court and the Conclusions of Law drawn therefrom and the Decree based thereon, but require the Findings proposed by the appellant and the Conclusions of Law and Decree requested by it to be made and entered (Assignment of Errors No. XVIII).

[fol. 318] And the appellant further states that only the following parts of the record, as filed in this Court, need be printed by the Clerk for the hearing of the case:

Title of paper	Pages of certified record
Bill of Complaint	3–19
Motion to Dismiss	27–31
Opinion of Court entered August 20, 1931	33–49
Order Denying Motion to Dismiss	50
Stipulation as to Right of Defendants to File Amended Answer	54–55
Amended Answer	56–79
Opinion entered December 30, 1931	80–89
Motion of Plaintiff to Make and Enter Findings of Fact and Conclusions of law, with Ruling thereon	90–110
Exceptions of Plaintiff to Refusal of Court to Make and Enter Findings of Fact and Conclusions of Law Proposed by Plaintiff and Exceptions To Findings and Conclusions Made and Entered and Decree Thereon (Except paragraphs one to twenty-four, inclusive, which may be omitted)	111–126
Order Allowing Exceptions	127
Findings of Fact and Conclusions of Law	128–145
Decree	146–147

Title of paper	Pages of certified record
Transcript of Evidence Settled and Allowed February 15, 1932	150–279
Petition for Appeal	280
Assignment of Errors and Prayer for Reversal	281–301
Order Allowing Appeal	302–303
Stipulation in Lieu of Præcipe	308–310
Statement of Points to be Relied Upon and Designation of Parts of Record to be printed.	

[fol. 319] Please omit all repetitions of title and note, in the printed record, the omission of the various instruments mentioned in the Stipulation in Lieu of Præcipe and certified to the Clerk of the Supreme Court.

Dated this 23rd day of February, 1932.

John F. MacLane, Solicitor for Appellant.

[fol. 320] Service of copy of foregoing is hereby duly admitted and the undersigned, Solicitors for the Respondents, represent that the record to be printed, as above requested, is sufficient and the same may be printed without waiting for any counter-designation.

Dated this 23rd day of February, 1932.

Fred J. Babcock, Sidman D. Barber, Maurice H. Greene, Solicitors for Respondents.

[fol. 321] [File endorsement omitted.]

Endorsed on cover: File No. 36,536. Idaho D. C. U. S. Term No. 722. Utah Power and Light Company, appellant, vs. Emmitt Pfost, Commissioner of Law Enforcement of the State of Idaho, et al. Filed February 23, 1932. File No. 36,536.

FILE COPY

FILED
MAR. 8
CHARLES ELMORE

Supreme Court of the United States.

OCTOBER TERM, 1931.

No. 722.

UTAH POWER & LIGHT COMPANY, A CORPORATION,
Appellant,

v.

EMMITT PFOST, COMMISSIONER OF LAW ENFORCEMENT OF THE STATE OF IDAHO, AND FRED J. BABCOCK, ATTORNEY GENERAL OF THE STATE OF IDAHO,
Respondents.

NOTICE OF MOTION AND MOTION OF APPELLANT TO HAVE CASE ADVANCED AND HEARD WITH OTHER CASES INVOLVING THE SAME QUESTION.

JOHN F. MacLANE,
Solicitor for Appellant.

SIMPSON THACHER & BARTLETT,
120 Broadway,
New York, N. Y.
Counsel.

Supreme Court of the United States.

OCTOBER TERM, 1931.

No. 722.

UTAH POWER & LIGHT COMPANY, a corporation,

Appellant,

AGAINST

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and FRED J. BABCOCK, Attorney General of the State of Idaho,

Respondents.

NOTICE OF MOTION OF APPELLANT TO HAVE CASE ADVANCED AND HEARD WITH OTHER CASES INVOLVING THE SAME QUESTION.

TO FRED J. BABCOCK, ESQ., ATTORNEY GENERAL OF THE STATE OF IDAHO, SIDMAN I. BARBER, ESQ., ASSISTANT ATTORNEY GENERAL AND MAURICE H. GREENE, ASSISTANT ATTORNEY GENERAL, SOLICITORS FOR RESPONDENTS:

PLEASE TAKE NOTICE that on the 14th day of March, 1932, or as soon thereafter as counsel can be heard, the within motion of appellant to have this case advanced and heard with other cases involving the same question will be submitted to the Supreme Court of the United States.

A printed copy of the motion is served upon you herewith.

JOHN F. MACLANE
Solicitor for Appellant.

SIMPSON THACHER & BARTLETT,
120 Broadway,
New York, N. Y.,
Counsel.

Due and timely service of this notice and the accompanying motion accepted this 2d day of March, 1932, and we hereby consent that the motion be granted if agreeable to the Court.

FRED J. BABCOCK
SIDMAN I. BARBER
MAURICE H. GREENE
Solicitors for Respondents.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1931.

No. 722.

UTAH POWER & LIGHT COMPANY, a corporation,

Appellant,

AGAINST

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and FRED J. BABCOCK, Attorney General of the State of Idaho,

Respondents.

MOTION OF APPELLANT TO HAVE CASE ADVANCED AND HEARD WITH OTHER CASES INVOLVING THE SAME QUESTION.

Comes now the appellant in the above entitled cause, and moves that this case be advanced and heard with other cases involving the same question, and in support of its motion, makes the following brief statement of the matter involved, and the reasons relied upon:

This is an appeal from a final decree of a special statutory court constituted under Section 380, Title 28, U. S. C. A. (Section 266 of the Judicial Code, as amended) dissolving an interlocutory injunction theretofore issued by said court, and denying a permanent injunction restraining the respondents from enforcing a certain Act passed by the 1931

Extraordinary Session of the Legislature of the State of Idaho. This Act provides for the payment of a tax of one-half mill per kilowatt hour upon the generation, manufacture or production of electricity and electrical energy in the State of Idaho.

From the decision of the special statutory court dissolving an interlocutory injunction, and denying a permanent injunction, entered on February 15, 1932 a direct appeal was forthwith taken to this Court under the provisions of Sections 345 and 380, Title 28, U. S. C. A. (Judicial Code, Sections 238 and 266, as amended). The certified transcript of record was filed, and the case docketed in this Court as No. 722, October Term 1931, on February 23, 1932. The record is now in the process of printing. A Statement as to Jurisdiction on Appeal was filed in this Court on February 26, 1932. Counsel for respondents filed with the Clerk an admission of service of the Statement, as of February 24, 1932, advising the Court that the respondents do not propose to file any Counter Statement and consenting that the appellant's Statement might be forthwith presented to the Court for action.

One of the principal questions involved in this case is whether or not a state statute imposing a tax upon the generation, manufacture or production of electricity and electrical energy, accomplished in connection with, and, it is claimed, as an integral and inseparable part of its transmission to and use in another state, is invalid as a direct burden upon interstate commerce. The appellant in this case generates electrical energy in Idaho in connection with its transmission to and use in Utah.

Three cases involving the same question applied to interstate generation and transmission to or from South Carolina, are now awaiting hearing before this Court. These cases are *South Carolina Power Company* v. *South Carolina Tax Commission*, No. 542, October Term, 1931; *Broad River Power Company* v. *Same*, No. 566, October Term, 1931; *Lexington Water Power Company* v. *Same*, No. 567, October

Term, 1931. These are three independent suits in equity brought against the South Carolina Tax Commission to enjoin the enforcement of a South Carolina statute likewise taxing the generation of electric power. One of the principal contentions made by the plaintiffs in these cases is that the tax levied by the statute (which is substantially the same in this respect as the Idaho statute involved in this case) imposes a direct burden upon interstate commerce as to electric energy entering into such commerce. They were heard together before a statutory court convened under Section 380, Title 28, U. S. C. A. (Section 266, Judicial Code, as amended) on applications for interlocutory injunctions which were denied. The decision of the statutory court is reported in 52 F. (2d) 515.

It is apparent, therefore, that the same question of law is involved in these three South Carolina cases as is involved here. The South Carolina cases were heard on affidavits on applications for interlocutory injunctions, whereas, in this Idaho case, an interlocutory injunction was granted and the cause proceeded to final hearing before the three judges; evidence was introduced by both parties covering fully both the scientific and practical aspects of the questions involved, and the case was decided on the merits after final hearing. In this case, therefore, the facts are more fully developed, and the record more complete, than in the three South Carolina cases. It will be helpful to the Court in deciding the question of law involved in this case and in the three South Carolina cases, to have before it the record in this case in which the facts are fully established by the evidence adduced on the final hearing.

WHEREFORE, the appellant, upon the ground that this case involves the same question as the three cases—*South Carolina Power Company* v. *South Carolina Tax Commission*, No. 542, October Term, 1931; *Broad River Power Company* v. *Same*, No. 566, October Term, 1931; *Lexington Water Power Company* v. *Same*, No. 567, October Term, 1931—moves this

Court, pursuant to Rule 20, Subdivision 8, that this case (No. 722) be advanced in order to be heard together with the said cases, and that they be argued as one case, or on such terms as may be prescribed.

Respectfully submitted,

JOHN F. MACLANE
Solicitor for Appellant.

SIMPSON THACHER & BARTLETT,
120 Broadway,
New York, N. Y.,
Counsel.

FILE COPY

FEB 25 19

Supreme Court of the United States.

OCTOBER TERM, 1931.

No. 722.

UTAH POWER & LIGHT COMPANY, A CORPORATION,
Appellant,

v.

EMMITT PFOST, COMMISSIONER OF LAW ENFORCEMENT OF THE STATE OF IDAHO, AND FRED J. BABCOCK, ATTORNEY GENERAL OF THE STATE OF IDAHO,
Respondents.

STATEMENT AS TO JURISDICTION ON APPEAL.

JOHN F. MacLANE,
Solicitor for Appellant.

SIMPSON THACHER & BARTLETT,
120 Broadway,
New York, N. Y.
Of Counsel.

IN THE

Supreme Court of the United States,

OCTOBER TERM 1931.

No. 722

UTAH POWER & LIGHT COMPANY, a corporation,
Appellant,

AGAINST

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and FRED J. BABCOCK, Attorney General of the State of Idaho,
Respondents.

STATEMENT AS TO JURISDICTION ON APPEAL.

The appellant in support of the jurisdiction of this Court to review the above entitled cause on appeal, and in compliance with Rule 12 of this Court, respectfully represents:

A.

Statutory Provisions Sustaining Jurisdiction.

This appeal is from a final decree of a special statutory court constituted under Section 380, Title 28, U. S. C. A. (Section 266 of the Judicial Code as amended) dissolving an interlocutory injunction theretofore issued by said court and denying a permanent injunction, in a suit to restrain

the enforcement of a statute of a state upon the ground of the unconstitutionality of such statute. This direct appeal to this Court therefore is taken and lies under the express provisions of Section 345, United States Code Annotated, Title 28 (Judicial Code, Section 238, as amended) which authorizes direct review by the Supreme Court of a final decree of a district court as provided in Section 380 of said Title 28, and under that clause of said Section 380 of said Title 28 (Judicial Code, Section 266, as amended) which provides that "a direct appeal to the Supreme Court may be taken from a final decree granting or denying a permanent injunction in such suit."

B.

Date of Decree and Date of Application for Appeal.

The decree sought to be reviewed was dated February 8, 1932 and filed on the 15th day of February, 1932 (R. 146-7).[1]

The application for appeal was filed on the 17th day of February, 1932 (R. 280).

C.

Nature of Case and Ruling Below.

Appellant filed its Bill of Complaint in the District Court of the United States, District of Idaho on June 16, 1931, by which it sought an interlocutory and permanent injunction restraining the respondents from enforcing a certain Act passed by the 1931 Extraordinary Session of the Legisla-

[1] All references to the record are to the pages of the certified unprinted record prepared by the Clerk of the United States District Court for the District of Idaho and on file with the Clerk of this Court. The record has not yet been printed.

ture of the State of Idaho. This Act provides for the payment of a tax of one-half mill per kilowatt hour upon the "generation, manufacture or production of electricity and electrical energy in the State of Idaho" (R. 16-19). It further provides that electrical energy used to pump water for irrigation purposes on lands in Idaho is exempt from the Act, but the full amount of the tax which would have been due from the producer of electrical energy, if such exemption had not been made, shall be credited by the producer on the power bill of the consumer (R. 16-19). It requires the payment of the tax monthly beginning July 15, 1931, and provides that if the tax is not paid in accordance with the terms of the Act, the amount owing shall draw interest at the rate of ten per cent. per annum, and that the producer of such electrical energy shall be liable for three times the amount of the tax, and the defendants herein, who are charged with the enforcement of the Act, may institute suit to enjoin the producer from further continuing to produce electricity (R. 16-19).

The appellant, which in addition to similar business in Idaho, generates and transmits electric power and energy in and through Idaho to Utah for distribution and use in the latter state, alleges in its Bill of Complaint that said Act is unconstitutional (1) because it is in conflict with Article 1, Section 8, Clause 3 of the Constitution of the United States in that it imposes a direct burden on interstate commerce engaged in by the appellant; (2) because the provisions for the payment of an amount equal to the tax by credit on the power bill of irrigation consumers of electric energy takes appellant's property without due process of law, and denies to it equal protection of the laws in violation of the Fourteenth Amendment of the Constitution of the United States; (3) because the act in various provisions is so ambiguous that it cannot be enforced except by purely arbitrary construction, likewise in violation of the Fourteenth Amendment; (4) because of other defects in the Act under the constitution of Idaho such as that the subject is not properly expressed in the title (R. 7; 10-13).

The appellant further alleges in its Bill the usual jurisdictional averments, and that it has no plain, speedy or complete remedy at law, and will suffer irreparable injury and be subjected to a multiplicity of suits for the collection of taxes monthly, and be subjected to unreasonable and excessive penalties if it refuses to pay the tax, and attempts to litigate the constitutionality of said Act (R. 13). There is no provision in said Act or in the general statutes of Idaho for the recovery of any taxes paid if said Act is held to be unconstitutional, and reimbursement of any money so paid could only be had by a subsequent act of the Legislature of said State (R. 13, 49).

When the Bill was filed, an application for an interlocutory injunction was made (R. 20-22). The District Judge for Idaho (Judge Cavanah) called to his assistance Circuit Judge William H. Sawtelle, and District Judge J. Stanley Webster of the District of Washington. Notice of the application was duly given and service made upon the Governor and Attorney General of the State of Idaho and the other defendant more than five days before the hearing (R. 24-26). After the hearing the Interlocutory Injunction was granted (R. 32, 51-53). The defendants appeared by Motion to Dismiss (R. 27-31), which was denied (R. 50), and later by answer (R. 56-79). The cause proceeded before the three judges to final hearing. Evidence was introduced (R. 150-279). Opinion on the merits adverse to appellant was rendered by the three judges December 30, 1931 (R. 80-89). Findings of Fact and Conclusions of Law were made and entered (R. 128-145). Final decree was entered accordingly on February 15, 1932, dismissing the plaintiff's Bill of Complaint, denying a permanent injunction, and dissolving the interlocutory injunction theretofore issued (R. 146-147). The temporary injunction was continued in force for thirty days to permit appeal and supersedeas (R. 148-149). Petition for appeal, assignment of errors and prayer for reversal were filed on February 17, 1932 (R. 280, 281-301). Said petition was allowed on said day (R. 302-303) and citation was thereupon issued and served (R. 306,

307), A bond for costs and supersedeas was given on the same day (R. 304-5). The transcript of record was filed and the case docketed in this court on February 23, 1932. This appeal is from such final decree.

D.

Cases Believed to Sustain Jurisdiction.

The jurisdiction of this Court on this appeal is within the express provisions of Sections 345 and 380 United States Code Annotated, Title 28, hereinabove referred to, and is sustained by the following decisions of this Court:

Clark v. *Poor*, 274 U. S. 554;
Interstate Busses Corporation v. *Blodgett*, 276 U. S. 245;
Herkness v. *Irion*, 278 U. S. 92.

Jurisdiction in a case substantially similar to this case, and involving a similar South Carolina Statute (*S. Carolina Power Co.* v. *So. Car. Tax Com.*, No. 542, Oct. Term 1931) was assumed by this Court on February 23, 1932.

All of which is respectfully submitted.

JOHN F. MACLANE,
Solicitor for Appellant.

SIMPSON THACHER & BARTLETT,
120 Broadway,
New York, N. Y.,
of Counsel.

FILE COPY

APR

CHARLES ELMORE

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1931.

No. 722.

UTAH POWER & LIGHT COMPANY, A CORPORATION,
Appellant,

v.

EMMITT PFOST, COMMISSIONER OF LAW ENFORCEMENT OF THE STATE OF IDAHO, AND FRED J. BABCOCK, ATTORNEY GENERAL OF THE STATE OF IDAHO,
Respondents.

BRIEF FOR APPELLANT.

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JESS B. HAWLEY,
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New York, N. Y.
On the Brief.

SUBJECT INDEX.

	PAGE
Statement of the Case	1
Specification of Errors	7
POINT I. The Tax Act imposes a direct burden on interstate commerce in violation of Clause 3, Section 8, Article I of the Constitution of the United States	12
Definition of terms	19
Description of electrical processes	21
Energy is drawn directly from its source, and not stored in the system	26
Function of transformers	27
Losses or system uses	30
The kilowatt hour as a measure of use, and as energy in commerce	31
Appellant's electric system operates in interstate commerce	35
Discussion of authorities	37
The Tax Act is inseparable and void in its entirety	48
Discussion of decision and opinion of the Statutory Court	50
POINT II. The Tax Act denies appellant equal protection of the laws and deprives it of property without due process in violation of the Fourteenth Amendment to the Constitution of the United States, and Section 13 of Article I of the Constitution of the State of Idaho, in that Section 5 of said Act compels the appropriation and payment of money by appellant for the benefit of private individuals, and likewise violates certain other provisions of the Constitution of Idaho	60
The constitutional provisions quoted	62
Under the guise of taxation Section 5 of the Tax Act grants a subsidy to users of electric energy for irrigation pumping	63

PAGE

Taxation for private purposes is void under the Fourteenth Amendment and other constitutional provisions 64
Section 5 of the Tax Act being unconstitutional the Act must fall in its entirety..... 70
Section 11 of the Tax Act does not save the constitutionality of the Act as a whole..... 72

POINT III. The Tax Act violates Section 16 of Article III of the Constitution of Idaho which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title..... 75
The title and Act contain two distinct subjects. 76
The subject of the Act is not expressed in the title 79

POINT IV. The Tax Act is void and unenforcible for the various uncertainties and ambiguities alleged in the Bill of Complaint, so that the enforcement thereof would constitute arbitrary administrative action, without legislative guide, and thus take appellant's property without due process of law in violation of the Fourteenth Amendment to the Constitution of the United States..... 83
The Tax Act affords no guide or means for the determination of what electric energy is subject to the tax..... 84
The Tax Act affords no means of determining the amount of energy generated for irrigation pumping 88
The Tax Act is highly penal in its nature, hence must be capable of definite construction and enforcement 90

APPENDIX. Chapter 3 of the Laws of the Extraordinary Session of the Legislature of the State of Idaho (1931) 95

TABLE OF CONSTITUTIONAL PROVISIONS, STATUTES, TEXTS AND CASES CITED.

CONSTITUTIONAL PROVISIONS.

PAGE

Constitution of the United States:

Article I, Section 8, Clause 3 2
Fourteenth Amendment 62, 63, 68

Constitution of Idaho:

Article I, Section 13 62
Article III, Section 16 ..... 76, 80, 85
Article VII, Section 2 ..... 39, 62
Article VII, Section 5 39
Article VII, Section 6 ..... 63, 68
Article VIII, Section 2 63

STATUTES.

Judicial Code, Section 266, as amended (Title 28, Section 345, U. S. C. A.) 1
Judicial Code, Section 238, as amended (Title 28, Section 380, U. S. C. A.) 1

Chapter 3, Laws of Idaho, 1931 (Extraordinary Session) 95

TEXTS.

Cooley's Constitutional Limitations, Eighth Edition, vol. I, page 310 81

CASES.

	PAGE
Allen *v.* Louisiana, 103 U. S. 80	50
American Manufacturing Co. *v.* City of St. Louis, 250 U. S. 459	55, 56
Bell's Gap R. Co. *v.* Pennsylvania, 134 U. S. 232	68
Bevis *v.* Wright, 31 Idaho 676	66
Bowman *v.* Continental Oil Co., 256 U. S. 642	49
Champlain Realty Co. *v.* Town of Brattleboro, 260 U. S. 366	47
Citizens Savings, Etc., Ass'n. *v.* Topeka, 20 Wall. (U. S.) 655	65, 67
Coe *v.* Errol, 116 U. S. 517	47
Cole *v.* City of LaGrange, 113 U. S. 1	66
Connally *v.* General Construction Company, 269 U. S. 385	91
Connolly *v.* Union Sewer Pipe Company, 184 U. S. 540	71
Crew Levick Co. *v.* Pennsylvania, 245 U. S. 292	46, 48
Darnell & Son *v.* Memphis, 208 U. S. 113	70
Dorchy *v.* Kansas, 264 U. S. 286	73
East Ohio Gas Co. *v.* Tax Commission, 283 U. S. 465	57
Eureka Pipe Line Co. *v.* Hallanan, 257 U. S. 265	47
Eyers Woolen Co. *v.* Town of Gilsum, 84 N. H. 1	66
Ferguson *v.* Ill. Cent. R. Co., 202 Ia. 508	66
Florida Central, etc., R. Co. *v.* Reynolds, 183 U. S. 471	68
Foster Packing Co. *v.* Haydel, 278 U. S. 1	41, 42
Freight Taxes, 15 Wall. (U. S.) 233	40
Guy *v.* Baltimore, 100 U. S. 434	70
Hailey *v.* Huston, 25 Idaho 165	78, 82
Heisler *v.* Thomas Colliery Co., 260 U. S. 245	55, 56
Helson *v.* Kentucky, 279 U. S. 245	46
Hope Natural Gas Co. *v.* Hall, 274 U. S. 284	55
Hope Natural Gas Co. *v.* Hall, 102 W. Va. 272	56

	PAGE
Howard *v.* Illinois C. R. Co., 207 U. S. 463	72
Hughes Bros. Timber Co. *v.* Minnesota, 272 U. S. 469	47
Idaho Power Company *v.* Thompson, 19 Fed. (2d) 547	38
In re Breene, 14 Colo. 401	81
International Harvester Co. *v.* Kentucky, 234 U. S. 216	93
International Textbook Co. *v.* Pigg, 217 U. S. 91	50
Jackson *v.* Gallet, 39 Idaho 382	82
Johnson *v.* Southern P. Co., 196 U. S. 1	70
Jones *v.* City of Portland, 245 U. S. 217	65
Katz *v.* Herrick, 12 Idaho 1	82
LeLoup *v.* Port of Mobile, 127 U. S. 640	41, 50
Lemke *v.* Farmers Grain Co., 258 U. S. 50	73
Matthews *v.* Rodgers (Feb. 15, 1932, Adv. Op. 271)	2
Missouri Pac. R. Co. *v.* Nebraska, 164 U. S. 403	65
New Jersey Bell Telephone Co. *v.* State Board of Taxes, etc., 280 U. S. 338	44
Nicchia *v.* New York, 254 U. S. 228	68
Northern Pacific Ry. Co. *v.* Gifford, 25 Idaho 196	39
Ohio Oil Co. *v.* Conway, 279 U. S. 813	2
Oliver Iron Co. *v.* Lord, 262 U. S. 172	55, 56, 57
Passenger Case, Smith *v.* Turner, 7 How. (U. S.) 283	40
Pioneer Irrigation District *v.* Bradley, 8 Idaho 310	78
Pioneer Irrigation District *v.* Walker, 20 Idaho 605	68
Pollock *v.* Farmers Loan & Trust Co., 158 U. S. 601	50
Posados *v.* Warner, B. & Co., 279 U. S. 340	77
Postal Telegraph Cable Co. *v.* Adams, 155 U. S. 688	39
Public Utilities Commission of Rhode Island *v.* Attleboro Steam & Electric Company, 273 U. S. 83	37
St. Louis-San Francisco Ry. Co. *v.* State, 118 Okla. 89	66
Sharpness *v.* Mayor, etc. of Philadelphia, 21 Pa. 147	65
Smith *v.* Turner (Passenger Case), 7 How. (U. S.) 283	40

PAGE

South Carolina Power Company *v.* South Carolina Tax Commission, 52 Fed. (2nd) 515..... 3, 58
Sprout *v.* City of South Bend, 277 U. S. 163..... 45
Standard Oil Co. *v.* State, 178 Ala. 400..... 93
State *v.* Banks, 37 Idaho 27..... 78
State Freight Taxes, 15 Wall. (U. S.) 233..... 40
State Tonnage Tax Cases, 12 Wall. (U. S.) 204..... 40
Station WBT *v.* Poulnot, 46 Fed. (2d) 671..... 43
Sullivan *v.* Butte, 65 Mont. 495..... 70
Technical Radio Laboratory *v.* Federal Radio Commission (App. D. C. 1929), 36 Fed. (2d) 111.. 44
Telegraph Co. *v.* Texas, 105 U. S. 460.....40, 41, 49
Tonnage Tax Cases, 12 Wall. (U. S.) 204..... 40
Turner *v.* Coffin, 9 Idaho 338..... 82
United Fuel Gas Co. *v.* Hallanan, 257 U. S. 277.... 47
United States *v.* American B. & M. Co., 31 Fed. (2d) 448..... 43
United States *v.* Capital Traction Co., 34 App. D. C. 592..... 92
United States *v.* Reese, 92 U. S. 214..... 50
United States *v.* Shreveport Grain & Elevator Co., 46 Fed. (2d) 354..... 93
Utah Mortgage Loan Corp. *v.* Gillis, 49 Idaho 676.. 82
Utah Power & Light Co. *v.* Pfost, 52 Fed. (2nd) 226..... 2
Utah Power & Light Co. *v.* Pfost, 54 Fed. (2nd) 803..... 2
Western Union Telegraph Co. *v.* Alabama, 132 U. S. 472..... 41
Western Union Tel. Co. *v.* Texas, 62 Tex. 630..... 92
Whitehurst *v.* Grimes, 21 Fed. (2d) 787..... 44
Williams *v.* Baldridge, 48 Idaho 618..... 67, 68
Williams *v.* Standard Oil Co., 278 U. S. 235..... 73

IN THE

Supreme Court of the United States.

OCTOBER TERM 1931.

No. 722

UTAH POWER & LIGHT COMPANY, a corporation,
Appellant,

AGAINST

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and FRED J. BABCOCK, Attorney General of the State of Idaho,
Respondents.

BRIEF FOR APPELLANT.

Statement of the Case.

This appeal is from a final decree of a special statutory court convened in the Southern Division of the District of Idaho, under Section 380, Title 28, U. S. C. A. (Section 266 of the Judicial Code as amended), dissolving an interlocutory injunction theretofore issued by said court and denying a permanent injunction, in a suit to restrain the enforcement of a statute of a state upon the ground of the unconstitutionality of such statute. This direct appeal to this Court therefore is taken and lies under the express provisions of that section and of Section 345, Title 28, U. S. C. A. (Judicial Code, Section 238, as amended). The decision of the court below on the application for interlocutory

injunction is reported in 52 Fed. (2nd) 226; and the decision on final hearing in 54 Fed. (2nd) 803.

Appellant filed its Bill of Complaint on June 16, 1931, seeking an interlocutory and permanent injunction restraining the respondents from enforcing a certain Act passed by the 1931 Extraordinary Session of the Legislature of the State of Idaho, described as Chapter 3 of the Laws of that Session, and, briefly, providing for the payment of a tax of one-half mill per kilowatt hour upon "all electricity and electrical energy generated, manufactured or produced in the State of Idaho" (R. 16-20). The Act is referred to herein as the "Tax Act", and is quoted in full in the Appendix.

The appellant, which in addition to similar business in Idaho, generates and transmits electric power and energy in and through Idaho to Utah and through Utah to Wyoming for distribution and use in the latter states, alleges in its Bill of Complaint that said Act is unconstitutional (1) because it is in conflict with Article 1, Section 8, Clause 3 of the Constitution of the United States in that it imposes a direct burden on interstate commerce engaged in by the appellant; (2) because of other defects intrinsic to the Act and apparent on its face, which will be hereinafter stated.

The appellant further alleges in its Bill the usual jurisdictional averments, and invokes the equitable jurisdiction of the court because it has no remedy at law, and will suffer irreparable injury and be subjected to a multiplicity of suits, and to unreasonable and excessive penalties, if it refuses to pay the tax, and attempts to litigate the constitutionality of the Act (R. 15). There is no provision in the Act or in the general statutes of Idaho for the recovery of any taxes paid if the Act is held to be unconstitutional, and reimbursement of any money so paid could only be had by a subsequent act of the Legislature of the State (R. 15). It is these features of the Act which entitle appellant to equitable relief within the rule of *Ohio Oil Co.* v. *Conway*, 279 U. S. 813, as held by the court below (R. 37), and which exclude the application of the rule recently involved in *Matthews* v. *Rodgers* (decided February 15, 1932, Adv. Op. 271).

After the interlocutory injunction was granted, defendants answered, the case was heard before a master, who reported the testimony to the statutory court, which rendered its opinion adverse to appellant on December 30, 1931 (R. 56-63), made findings of fact and conclusions of law accordingly (R. 84-94), and on February 15, 1932, entered a decree dissolving the interlocutory injunction, and requiring the payment of the tax in question (R. 95). This appeal is from the final decree (R. 216) and brings up a statement of the evidence (R. 96-216) and exceptions (R. 80-83) to the findings and conclusions made by the court, which exceptions were allowed (R. 83-84), and to the refusal by the Court (R. 80) of appellant's requests for findings and conclusions (R. 64-79). With respect to appellant's exceptions, it should be observed that the printed record omits by stipulation (R. 237) paragraphs 1 to 24 of the exceptions, on the ground that they are specifically recited in paragraph XVI of the Assignment of Errors (R. 224-229), it being stipulated that "such exceptions are sufficient to present for review all matters assigned as error in paragraph No. XVI of said Assignment of Errors", and are omitted from the printed record to avoid repetition and shorten such record (R. 237).

Statement as to Jurisdiction on Appeal was filed in this Court on February 26, 1932, and this Court on March 14, 1932 noted probable jurisdiction, and in conformity with a motion made by appellant and consented to by the respondents, on the same day advanced this case for argument to be heard with the cases of *South Carolina Power Company* v. *South Carolina Tax Commission*, No. 542, October Term, 1931; *Broad River Power Company* v. *Same*, No. 566, October Term, 1931; *Lexington Water Power Company* v. *Same*, No. 567, October Term, 1931.

The reason for the argument of these cases together is that they all involve, as a common question, the contention that a state tax upon kilowatt hours of electric energy is, as to energy which moves in interstate commerce, a burden on such commerce. The different cases involve different aspects of

that common question. The particular aspect of the question presented in this case will be hereinafter stated.

In addition to this question of interstate commerce common to these cases, there are also presented other questions of equal importance to a determination of this case, which are not involved in the South Carolina cases. They will appear from the following brief statement of the facts, and are specifically stated in the specification of errors.

The essential facts necessary to an understanding of the questions presented to the court below, and to be presented to this Court, are as follows:

In 1931 the Idaho Legislature met in regular session. During this session an attempt was made to pass an act designed to levy a tax upon the production, generation and manufacture of electricity and electrical energy. A bill was introduced for this purpose known as House Bill No. 44. It was before the Idaho Legislature for about forty days, during which period of time hearings were had before a committee to which the bill had been referred. The Legislature, at its regular session, did not pass the bill, but it did, however, levy the general *ad valorem* tax sufficient to meet all expenses of the government of the State for the ensuing biennium (R. 100).

The Legislature adjourned *sine die* on the 5th day of March, 1931. On the same day and prior to the adjournment, the Governor issued a proclamation calling the Legislature to meet in special session on the 6th day of March, 1931, for the purpose of considering revenue legislation.

The extraordinary session of the Legislature convened pursuant to the call on March 6, 1931. Thereupon, the Governor read a message in which he urged the passage of an income tax bill and of a bill imposing a tax upon electrical energy generated within the State of Idaho.

The Act now under review was passed March 13th, was signed by the Governor on March 17th, and became effective May 12, 1931.

A brief summary of the Act is as follows (Act quoted at length in Appendix).

The title purports to levy "a license tax of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange" and that there shall be exempted from the tax "the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the state of Idaho and providing that such exemptions shall accrue to the benefit of the consumer". The title is important. We shall point out variations between title and Act, and that two subjects are embraced in both.

Section 1 provides: That in addition to the licenses and taxes now provided by law, every individual, corporation, etc., engaged in the "generation, manufacture or production of electricity and electrical energy in the State of Idaho" for "barter, sale or exchange" shall, on or before the 15th day of each calendar month, beginning with July 15, 1931, render a statement to the Commissioner of Law Enforcement of the State of Idaho of all electricity and electrical energy, generated, manufactured or produced in the State of Idaho during the preceding calendar month and therewith pay a license tax of one-half mill per kilowatt hour on all such electricity and electrical energy so "generated, manufactured or produced, measured at the place of production."

Section 5 is unique. Undoubtedly it was inserted to secure passage of the Act. House Bill 44 (R. 101), which failed of passage at the regular session, did not contain this or a similar provision. This section provides, in effect, that "all electricity and electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho is exempt" from the provisions of the Act, which exemption, however, shall "accrue to the benefit of the consumer of such electricity or electrical energy." It further provides that the "producer" of such electrical energy shall credit annually the amount of tax that would otherwise be paid "on the power bills to the consumers of such electricity and electrical energy for pumping of water for irrigation to be used on lands in the State of Idaho." This section plainly uses the power of taxation for private benefit.

The penalties prescribed in the Act for failure to conform to its requirements are severe. Section 2 imposes an interest penalty of 10% on delinquencies. Section 7 makes false statements perjury without reference to guilty knowledge or intent. Section 8 makes the producer who fails to pay the tax when due, liable for three times the amount of the unpaid tax, and to injunction without bond restraining the production of electric energy until the tax is paid. There is no provision in the Act or under the general laws of the State for payment of the tax under protest or recovery of taxes illegally collected (R. 15).

Section 9 provides that the amount of the tax collected thereunder shall be deducted from the general state *ad valorem* tax on real and personal property, thus reducing the tax otherwise payable by the taxpayers of the state at large.

The appellant owns and operates an inter-connected alternating current electric power system consisting of generating stations, transmission and distribution lines, and other electrical equipment located in the States of Idaho, Utah and Wyoming, by which energy in the electrical form is generated, transmitted and distributed in barter, sale and exchange to its customers in all three states. As will be later shown, the "generation," "manufacture" or "production" of electric energy is integral with, and inseparable from, its transmission and use, and upwards of 84 per cent of all electric energy generated by the appellant in Idaho is generated and transmitted directly in interstate commerce for use in Utah and Wyoming.

Appellant, during the year 1930, paid in *ad valorem* taxes in the State of Idaho $412,090.07, upon an assessed valuation of $11,088,009.00. In addition thereto, it paid its annual license tax imposed by the State for the privilege of doing business therein. It will likewise be required to pay an income tax pursuant to an Act passed at the same extraordinary session. If the Act now under attack is valid, appellant will be required to pay upwards of $100,000 per year additional, or a total, exclusive of income tax, of over

$510,000. Appellant received in the year 1930, from its customers in Idaho for electric energy sold therein, approximately $735,000.00 (Findings, R. 88). Thus, approximately 70 per cent of its revenues from Idaho business exclusive of interstate business is now demanded by the State of Idaho in taxes.

There is no substantial controversy as to material facts, except on the question of the nature of electrical processes as involved in the solution of the question as to whether the tax burdens interstate commerce, and the matters there in dispute are more in the nature of the ultimate conclusions to be drawn from the facts than of the facts themselves.

The contentions of appellant in its Bill, which were decided adversely to it by the special statutory court below, are stated in the following Specification of Errors:

Specification of Errors.

Appellant will urge the following assigned errors preserved in its "Statement of Points to be Relied Upon".

I.

The special statutory court, sitting in the District Court for the District of Idaho, Southern Division (hereinafter referred to as the court), erred in dismissing appellant's Bill of Complaint, dissolving the interlocutory injunction theretofore issued, ordering payment of the tax required by the Tax Act described in the Bill of Complaint, and in refusing to decree a permanent injunction restraining enforcement of said Tax Act, as against the appellant, the specific grounds of such error being hereinafter stated (Assignment of Errors No. I) (R. 217).

II.

The court erred in finding and concluding that the Tax Act, as applied to the appellant and its operations, does

not impose a direct burden on interstate commerce, in violation of Clause 3, Section 8, Article I of the Constitution of the United States. (Assignment of Errors No. III) (R. 218).[1]

III.

The court erred in not finding and concluding that the Tax Act denies appellant equal protection of the laws and deprives appellant of its property without due process of law, in violation of the Fourteenth Amendment of the Constitution of the United States, and also Section 13 of Article I of the Constitution of the State of Idaho, in that Section 5 of said Act compels the appropriation and payment of money by appellant for the sole and exclusive benefit of private individuals without compensation to appellant therefor (Assignment of Errors Nos. IV and VII) (R. 218, 219).[2]

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[1] Under this point there are presented the errors in the Findings of Fact and Conclusions of Law, relating to the interstate commerce question the making of which is assigned as error in paragraphs Nos. XIV (R. 220, 221, 222), and XV Subdiv. (k) (R. 224), of the Assignment of Errors, and the failure and refusal of the court to make the Findings of Fact and Conclusions of Law requested by the appellant in its motion therefor, such failure and refusal being specifically set forth in paragraphs Nos. XVI Subdivisions (a) to (s) inclusive (R. 224, 225, 226, 227, 228, 229), and XVII subdiv. (i) (R. 234), and XVIII (R. 234), of the Assignment of Errors.

[2] Under this point there are presented the errors in the Conclusions of Law, the making of which is assigned as error in paragraph No. XV Subdivisions (a), (b) and (d) (R. 222, 223), of the Assignment of Errors, and the failure and refusal of the court to make the Findings of Fact and Conclusions of Law on this point requested by appellant in its motion therefor, such failure and refusal being specifically set forth in paragraphs Nos. XVI, Subdivision (t), and XVII, Subdivisions (b), (c) and (e) (R. 229, 232, 233) of the Assignment of Errors.

IV.

The court erred in not finding and concluding that the Tax Act violates Section 2 of Article VIII, and Section 2 of Article VII of the Constitution of the State of Idaho, in that said Tax Act constitutes the levying of a tax for other than a public purpose, to wit: for the benefit of an individual (Assignment of Errors No. V) (R. 218). The court also erred in not finding and concluding that the Tax Act violates Section 6 of Article VII of the Constitution of the State of Idaho in that it imposes a tax for the benefit of municipal corporations, to wit: irrigation districts (Assignment of Errors No. VI) (R. 218).[3]

V.

The court erred in not finding and concluding that the Tax Act violates Section 16 of Article III of the Constitution of the State of Idaho, which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title (Assignment of Errors Nos. VIII, IX and X) (R. 219).[4]

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[3] Under this point there are presented the errors in the Conclusions of Law, the making of which is assigned as error in paragraph No. XV, Subdivisions (e), (f), (g) and (h) (R. 223), of the Assignment of Errors, and the failure and refusal of the court to make the Findings of Fact and Conclusions of Law on this point requested by the appellant in its motion therefor, such failure and refusal being specifically set forth in paragraphs Nos. XVI, Subdiv. (t), and Subdiv. (u) B, and XVII, Subdiv. (e) (R. 229, 233), of the Assignment of Errors.

[4] Under this point there are presented the errors in the Conclusions of Law, the making of which is assigned as error in paragraph No. XV, Subdiv. (c), (R. 222, 223) of Assignment of Errors, and the failure and refusal of the court to make the Findings of Fact and Conclusions of Law requested by appellant in its motion therefor, such failure and refusal being specifically set forth in paragraphs Nos. XVI, Subdiv. (u) A, and XVII, Subdiv. (d), (R. 229, 230, 232, 233) of the Assignment of Errors.

VI.

The court erred in not finding and concluding that the Tax Act is void and unenforcible for the various uncertainties and ambiguities alleged in the Bill of Complaint, and that the enforcement thereof would constitute taking appellant's property without due process of law, in violation of the Fourteenth Amendment to the Constitution of the United States (Assignment of Errors No. XIII) (R. 220).[5]

VII.

The court erred in not finding said Tax Act void, as applied to the appellant and its operations, for each of the reasons herein recited, and in not also finding and concluding that Section 5 of said Tax Act cannot be eliminated from said Tax Act without destroying the entire Act, and that it is impossible to segregate the tax attempted to be imposed by the said Tax Act and measured by the intrastate business done by the appellant from that measured by the interstate business done by the appellant, and that said Tax Act, because of the inseparability of the intrastate business and the interstate business, is void *in toto* (Assignment of Errors, No. XVII (c) and (j)) (R. 232, 234).

VIII.

The evidence as a whole, and particularly that evidence showing the process of generation, transmission and use of electric energy upon the appellant's system and the manner and method of appellant's operations in the generation, transmission and sale of electric energy in and between the States of Idaho, Utah and Wyoming, fails to support the Findings

[5] Under this point there are presented the error in the Conclusion of Law, the making of which is assigned as error in paragraph No. XV, Subdiv. (j) (R. 224) of the Assignment of Errors and the failure and refusal of the court to make the Findings of Fact and Conclusions of Law on this point requested by appellant in its motion therefor, such failure and refusal being specifically set forth in paragraphs Nos. XVI, Subdivisions (v) and (w), and XVII, Subdiv. (h), (R. 231, 233) of the Assignment of Errors.

of Fact made and entered by the court and the Conclusions of Law drawn therefrom and the Decree based thereon, but requires the Findings proposed by the appellant and the Conclusions of Law and Decree requested by it to be made and entered (Assignment of Errors No. XVIII) (R. 234).

Numbers I and VIII of the above Specification of Errors are general and apply to the argument under the other specifications. Numbers III and IV may be conveniently discussed together and Number VII may be best discussed in connections with Numbers II, III and IV.

Therefore, in brief, the points for discussion may be classified as follows:

1. That the Tax Act imposes a direct burden on interstate commerce in violation of Clause 3, Section 8, Article I of the Constitution of the United States.

2. The Tax Act denies appellant equal protection of the laws and deprives it of property without due process in violation of the Fourteenth Amendment to the Constitution of the United States, and Section 13 of Article I of the Constitution of the State of Idaho, in that Section 5 of said Act compels the appropriation and payment of money by appellant for the benefit of private individuals, and for the same reasons violates Section 2 of Article VII and Section 2 of Article VIII of the Constitution of Idaho in that it levies a tax for other than for a public purpose, to wit: for the benefit of individuals, and violates Section 6 of Article VII of the Constitution of Idaho in that it imposes a tax for the benefit of municipal corporations, to wit: irrigation districts.

3. The Tax Act violates Section 16 of Article III of the Constitution of Idaho, which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title.

4. The Tax Act is void and unenforcible for the various uncertainties and ambiguities alleged in the Bill of Complaint, so that the enforcement thereof would constitute arbitrary administrative action, without legislative guide, and thus take appellant's property without due process of law in violation of the Fourteenth Amendment to the Constitution of the United States.

I.

POINT.

The Tax Act imposes a direct burden on interstate commerce in violation of Clause 3, Section 8, Article I of the Constitution of the United States.

Authorities.

United States Constitution, Article I, Section 8, Clause 3.

Public Utilities Commission of Rhode Island v. *Attleboro Steam & Electric Company,* 273 U. S. 83.

Idaho Power Company v. *Thompson,* 19 Fed. (2nd) 547.

Northern Pacific Railway Co. v. *Gifford,* 25 Idaho 196.

Postal Telegraph Cable Company v. *Adams,* 155 U. S. 688.

State Freight Tax Cases, 15 Wall (U. S.) 232.

Smith v. *Turner* (*Passenger Case*), 7 How. (U. S.) 283.

State Tonnage Tax Cases, 12 Wall (U. S.) 204.

Telegraph Co. v. *Texas,* 105 U. S. 460.

LeLoup v. *Port of Mobile,* 127 U. S. 640.

Western Union Telegraph Company v. *Alabama,* 132 U. S. 472.

Foster Packing Company v. *Haydel,* 278 U. S. 1.

Station WBT v. *Poulnot,* 46 Fed. (2nd) 671.

United States v. *American B. & M. Co.,* 31 Fed. (2nd) 448.

Whitehurst v. *Grimes,* 21 Fed. (2nd) 787.

Technical Radio Laboratory v. *Federal Radio Commission,* 36 Fed. (2nd) 111.

New Jersey Bell Telephone Company v. *State Board of Taxes, etc.,* 280 U. S. 338.

Sprout v. *City of South Bend*, 277 U. S. 163.
Crew Levick Co. v. *Pennsylvania*, 245 U. S. 292.
Helson v. *Kentucky*, 279 U. S. 245.
Eureka Pipe Line Company v. *Hallanan*, 257 U. S. 265.
United Fuel Gas Co. v. *Hallanan*, 257 U. S. 277.
Coe v. *Errol*, 116 U. S. 517.
Champlain Realty Co. v. *Town of Brattleboro*, 260 U. S. 366.
Hughes Bros. Timber Company v. *Minnesota*, 272 U. S. 469.
Bowman v. *Continental Oil Company*, 256 U. S. 642.
United States v. *Reese*, 92 U. S. 214.
Allen v. *Louisiana*, 103 U. S. 80.
Pollock v. *Farmers Loan & Trust Co.*, 158 U. S. 601.
International Textbook Company v. *Pigg*, 217 U. S. 91.
Oliver Iron Company v. *Lord*, 262 U. S. 172.
Hope Natural Gas Co. v. *Hall*, 274 U. S. 284.
American Manufacturing Company v. *St. Louis*, 250 U. S. 459.
Heisler v. *Thomas Colliery Co.*, 260 U. S. 245.
East Ohio Gas Co. v. *Tax Commission*, 283 U. S. 465.
South Carolina Power Company v. *South Carolina Tax Commission*, 52 Fed. (2nd) 515.

Summary.

(1) The tax involved in this case—on the kilowatt hour of electric energy—is not a tax on the manufacture of goods or on the production or extraction of a product of nature but on the transfer or conveyance of energy in nature from its source to its place of use. When this transfer is across state lines it is interstate commerce (*infra*, pp. 17-21).

(2) The "generation" of electric energy is a part of the process of transferring energy from a source in nature such as falling water to some point where it may be usefully applied. Energy cannot be "generated, manufactured or produced" except as it is transmitted and used. The process through the generator is continuous and simultaneous with the consumer's demand for energy. That part of the process described as generation is the part which is responsible for and causes the movement. The generator is thus an instrumentality of commerce. The entire combined process of generation, transmission and use is integral, continuous and essentially simultaneous. Electric energy travels approximately at the speed of light, 186,000 miles per second (*infra,* pp. 21-26).

(3) Energy transferred to the consumer is drawn directly from its source at the water fall and is not stored in the system either at the consumer's place of use or some intermediate point. It is not analogous to a water or gas system with storage facilities either separately furnished or present in the water main or gas pipes (*infra,* pp. 26-27).

(4) Transformers interposed in the system for economy in transmission, while they result in interrupting the flow of electric current and in the induction of a different voltage and current on the other side of the transformer do not interrupt the flow of electric power and energy. This passes directly from its source through the transformers along the transmission line to the place of use. It is this energy, and not current or voltage, measured in terms of kilowatt hours, which is taxed by the Act involved in this case (*infra,* pp. 27-30).

(5) So-called losses in the electric system on account of which more energy leaves the generator than is delivered to the consumer do not alter the fundamental nature of the process. The system itself is a consuming device to the extent that it requires the transfer of certain energy from the source

to enable the system to function and keep it electrically alive. These so-called losses are used in the system and impress a demand upon the generator of exactly the same nature as the demand exerted by the devices of the consumers (*infra*, pp. 30-31).

(6) The kilowatt hour is a mathematical product of the power relation in the electric circuit between the generator and the receiving device measured in kilowatts and hours. It is a measure of the relationship expressed in terms of power demand (kilowatts) and the duration in time that that demand is exerted (hours). It is therefore a measure of the use of the vehicle of commerce which we call the electric system. Energy conceived of as leaving a generator in one state in response to the demand of a consumer in another state, and measured in terms of kilowatt hours, is in transit, and in fact actually crossing the state line and used by the consumer in the second state simultaneously with its measurement (*infra*, pp. 31-35).

(7) That part of appellant's system which consists of generating stations in Idaho, and transmission lines across the Utah-Idaho line to Utah to the terminal substation in Utah where it is connected with transmission lines for local distribution systems to consumers' devices, operates in interstate commerce. Whether such commerce extends beyond the terminal substation is not involved in this case. *Public Utilities Com. of R. I.* v. *Attleboro Steam & Elec. Co.*, *supra*; *Idaho Power Company* v. *Thompson*, *supra* (*infra*, pp. 35-37).

(8) The tax imposed by the Act under review is a license tax exacted of appellant as a condition of continuing its business. As applied to interstate business, it is similar to a tax on a ton of freight, considered in the *State Freight Tax Cases*, or upon passengers carried, as in the *Passenger Cases*, or on the tonnage of vessels, as in the *Tonnage Cases*, or upon telegraph messages as in the *Telegraph Cases*. Being levied

at a unit rate on energy in interstate commerce, it cannot be sustained as a license tax for the privilege of conducting an intrastate business (*infra*, pp. 37-41).

(9) While the Act describes the tax as levied upon the kilowatt hour generated, manufactured or produced, yet the process of generation is simultaneous and interdependent with the transmission and use. The Act burdens transmission and use equally with generation. The generator is an instrumentality of commerce. It is this inseparability of process which makes the whole interstate commerce. *Foster Packing Co.* v. *Haydel, supra; Station WBT* v. *Poulnot, supra,* and other cases cited. In this respect, it is also within the rule of *New Jersey Bell Tel. Co.* v. *State Board of T. & A.; Sprout* v. *City of South Bend* (*infra*, pp. 41-47).

(10) Since the tax falls and has its incidence on energy already in commerce, and is measured by the amount of the commerce in energy, it is likewise void under the rule announced in *Eureka Pipe Line Co.* v. *Hallanan; Coe* v. *Errol; Champlain Realty Co.* v. *Town of Brattleboro;* and other cases cited (*infra,* pp. 47-48).

(11) The Act in burdening interstate commerce is void in its entirety because it appears that the intent of the Act is to tax the whole business and no provision is made for the separate determination of interstate and intrastate business. *Crew Levick Co.* v. *Pennsylvania; Bowman* v. *Continental Oil Co., supra,* (*infra,* pp. 48-50).

(12) The statutory court erred in its findings of fact and conclusions of law, wherein it found certain facts inconsistent with the evidence and conclusions deducible therefrom as hereinbefore stated, and held that the Tax Act is valid and does not burden interstate commerce (*infra,* pp. 50-55).

(13) Decisions in *Hope Natural Gas Company* v. *Hall, supra, Oliver Iron Company* v. *Lord, supra, Heisler* v. *Thomas Colliery Co., supra, American Manufacturing Company* v. *St. Louis, supra, East Ohio Gas Co.* v. *Tax Commission, supra,* reviewed and distinguished (*infra,* pp. 55-59).

Argument.

The tax involved in this case—on the kilowatt hour of electric energy—is not a tax on the manufacture of goods or on the production or extraction of a product of nature but on the transfer or conveyance of energy in nature from its source to its place of use. When this transfer is across state lines it is interstate commerce.

The language of the Idaho Statute (herein called "Tax Act") in purporting to levy a tax on the "manufacture" or "production" of electricity or electric energy begs the question at issue by designating the electrical process as something that it is not. For purposes of designation, we use the other statutory term "generation", but without preconception as to its meaning.

Our fundamental thesis is that an electric system, consisting essentially of what are called generator, transmission line, and consumer's motor or other consuming device, is an integral unitary apparatus for the transfer of energy from its source (as a waterfall) to and use at destination. No part of this apparatus, *e. g.,* the generator, can function except as a part of the whole, synchronously and integrally therewith. The functioning of the generator is dictated by the consumer, who through it, in conjunction with the transmission line and his consuming device, draws energy at his will directly from its source The generator is an instrumentality of commerce, the function of which is to cause the energy to flow in the electric vehicle. The commercial unit of measurement which is sought to be taxed by the Tax Act,—the kilowatt hour,—is a measure of the magnitude and duration

of the consumer's use of the facilities provided for the transfer of the energy. In other words, an electrical system, in all its parts, is a vehicle for the transfer of energy; the kilowatt-hour is the commercial measure of the consumer's use of that vehicle. The energy is in commerce during the entire course of its transit through the electric vehicle. Consequently, a tax on the kilowatt hour is upon the measure of use in commerce of a vehicle of commerce, or upon the energy while in commerce. In either case when such commerce is between states the tax falls under the condemnation of the commerce clause of the Constitution.

In the development of this thesis, which necessarily involves a scientific as well as a practical conception of electrical processes, we refer directly to the testimony of the witnesses in the case, and we must invite the court's attention to a somewhat technical discussion of the processes involved, as well as to their practical application in business and commerce.

By way of introduction we first present the witnesses.

The scientific or technical witnesses for the plaintiff were:

Dr. Robert A. Millikan, Director of the Norman Bridge Laboratory of Physics of the California Institute of Technology, Pasadena, California, and probably the most widely known physicist of the country today; Dr. Irving Langmuir, Associate Director of the Research Laboratory of the General Electric Company at Schenectady, New York, and F. W. Peek, Chief Engineer of the General Electric Company's Transmission and Transformer Works at Pittsfield, Massachusetts, one of the country's best known engineers on electrical transmission, and author of the article on Transformers in the Encyclopedia Brittanica, Fourteenth Edition, cited and relied on by the lower court in the cases of *South Carolina Power Company* (and other companies) v. *South Carolina Tax Commission* (Nos. 542, 566 and 567) now under review by this Court with this case.

The respondents' principal witness on the technical or scientific aspects of the case was Dr. Carl Magnusson, Professor

of Electrical Engineering at the University of Washington, Seattle, Washington, and a well known author of text books in this field. In addition to Dr. Magnusson there testified on behalf of respondents, Mr. Wellington Rupp, an engineer of Seattle.

The appellant's system and its operations as between Idaho and Utah were described by a former chief engineer, Mr. Markham Cheever, and the present chief engineer of the appellant company, Mr. J. A. Hale. The commercial aspects of the company's operations as involved in its business between Idaho and Utah were testified to by the company's president and general manager, Mr. G. M. Gadsby.

We think it may be fairly stated that there is no substantial dispute on material facts either scientific or practical. The real dispute in the case arises from the conclusions which counsel draw from facts which in themselves are substantiated by all the testimony. If there is a difference between the scientific witnesses for the appellant and those for the respondents it is rather one of emphasis and terminology than of fact. These scientific witnesses are authorities in their fields and entitled to the full confidence of this Court.

Definition of terms:

The Tax Act under consideration in this case uses the terms "manufacture", "production", and "generation" interchangeably. It likewise uses, as synonyms, the terms "electricity", and "electrical energy". It speaks of "kilowatt hours of electricity and electrical energy" as "produced", or "manufactured" as one would speak of quantities of a material thing. The lower court in the South Carolina decision (No. 542) apparently conceives of "electric current" as the thing which is generated, or produced, by the generator, and shipped in commerce. While these uses of terms are common in popular parlance, and are sometimes followed by the witnesses in this case, they are inaccurate, and unless clearly understood, lead to incorrect conclusions on the essential nature of the process involved. It is necessary, therefore, to preface our discussion with accurate definitions.

Mr. Peek says (R. 184-187) and Dr. Magnusson concurs (R. 206):

"*Electricity* is a subtle imponderable physical agency manifesting itself in certain known ways. While the essence of electricity may be considered as yet somewhat obscure, its laws and characteristics are so well-known by the electrical engineer as to enable him to design electrical apparatus and predict their performance with great precision."

"*Electric current*"—"Electricity may be either at rest or in motion. Electricity in motion constitutes electric current."

"*Electric voltage*"—"Called also electric tension and electro-motive force, is a state of electro-magnetic medium somewhat analogous to mechanical pressure."

"*Electric power*"—"Power manifesting itself through the instrumentality of electric voltage and current is known as electric power."

"*Electric energy*"—"Electric power used through a period of time is known as electric energy."

"*A generator* is an instrumentality whereby energy may pass from a mechanical medium into an electric medium. A generator does not, in any sense, generate or produce 'current' or electricity. It does not generate energy. It can be said to generate an electric tension or voltage, that is, a certain state of the electric medium, whereby it becomes possible for electricity that is already dormant to get into circulation, and whereby it becomes possible for a useful load to draw energy from a distant waterfall."

"*Transformers* are electrical links making it possible to connect circuits of different voltage and current with each other."

The tax in this case is on the kilowatt hour. With respect to this unit of measurement, Dr. Millikan says (R. 111):

> "The kilowatt or one thousand watts is a measure of electric power. It is comparable to the horsepower by which mechanical power is measured. The horsepower is the power required to lift a 550 pound weight one foot in one second of time. A kilowatt is approximately four-thirds of a horsepower, and therefore is an expression of the power required to lift 737.6 pounds one foot in a second.
>
> A 'kilowatt hour', the usual unit for measuring energy in the electrical form, is a mathematical product of the power relation in the electrical circuit between the generator and a receiving device measured in kilowatts, and the duration of time over which that utilization is measured in hours."

Description of electrical processes:

Much of the obscurity to the nonscientific mind which surrounds the process which we are considering in this case, is avoided if the above definitions are clearly kept in mind throughout the discussion.

Dr. Millikan (R. 110, 111), describes this process as follows:

> "The terms 'generation', 'manufacture' and 'production' as applied to energy in the electrical form are merely convenient designations applied to one aspect of the process of transferring energy from some source in nature, such as falling water, for example, to some point where it may be usefully applied.
>
> The various facilities used in the process of electrical supply are purely transferring devices. The falling water pushes against the blades of a water-wheel, thus causing the shaft to revolve and with it the rotating portion of the electric generator. The power of the water is transferred mechanically along the shaft from the water-wheel to the generator continuously and essentially simultaneously with the demand upon the generator. The electric generator consists essentially of a system of conducting wires moving through a magnetic field. This process serves to transfer the mechanical

energy of the motion to electrical energy in the wires. In this process of transfer of the energy from the mechanical to the electrical form, no material is required or consumed. The energy drawn from the water is merely changed from one form to another and passed along. The process through the generator is continuous and the action essentially simultaneously with the consumer's demand for energy.

There is a continuous electrical and electromagnetic path or circuit between the windings in the generator and the windings in the consumer's motor or between the generator windings and the filament in an electric lamp or the electrodes in an electro-chemical cell. The entire electric system functions to transfer the force of the falling water to, and to apply it at, the point where it is to be utilized. Except as and during the period that energy is called for, and used at the final point of utilization, the electric generator neither receives from the water-wheel-shaft, nor delivers to the electric transmission line, any energy other than that necessary to hold the equipment under constant rotation and electric charge in instant readiness to serve.

The entire combined process, mechanical, electrical and magnetic, is integral, continuous and essentially simultaneous, or instantaneous. Electricity travels approximately at the speed of light, 186,000 miles per second."

So intimate and interdependent is the relationship of generator to transmission line and consuming device, that if the full amount of water for which the turbine is designed is permitted to pass through the gates, and the generator is thus caused to revolve without being connected to a transmission line or consuming device, the generator would destroy itself through the operation of centrifugal force, or burn itself up through mechanical heat (R. 121-122). In other words, a generator cannot operate electrically to convert, produce or transfer electrical energy, except as connected to an electrical system including consuming devices.

Dr. Langmuir describes the process in different language, but with essentially the same effect. Summarizing from his testimony (R. 124-128), without quoting in detail, he says:

One of the most important natural laws is the principle of the conservation of energy, according to which energy cannot be created nor destroyed but can merely be transformed or converted from one form to another. Mechanical energy may be transmitted by a series of belts, or rotating shaft, or by compressed air, or by water transmitted through a pipe line. The most important method of transmitting energy, as such, is by electric transmission. In the case of water power, water from a reservoir at a high elevation is allowed to flow to a point at lower elevation by means of which its potential or gravitational energy is automatically transformed into kinetic energy. A turbine is interposed whose blades receive the impact of the rapidly moving water and the kinetic energy is delivered to the shaft in the form of mechanical energy. Connected to this rotating shaft is a generator in which copper conductors are made to move across a magnetic field. This action causes electric current to flow in the generator at a pressure or voltage. The power which was originally present in the water is now electric power, but this power can only be generated if current from the generator is allowed to flow away through the electric circuit. This involves a transmission line leading to the consumers through transformers, and each consumer converts the electric energy into some other form of energy suitable to his needs, as heat for cooking, or mechanical energy for motors, or for electro-chemical processes, or in some other way. The electric generator cannot function to produce or generate or transfer energy except as the consumer is ,at the same time, conversely converting the energy into some other form than electrical at his end of the circuit. The generator and consuming device are inherently and essentially dependent on one another just as though they were geared together. The velocity with which electric power is transmitted is practically that of light, that is, 186,000 miles a second. The transmission from all practical points of view must be considered as instantaneous, so that the generation and consumption of power occur simultaneously.

Dr. Magnusson, for the respondents, corroborates the appellant's witnesses. He says (R. 203, 204):

The source of energy which is transferred by an electric system is in nature already existing external to the system. The system is interposed for the purpose of "transferring and converting" this energy from its source to the place where it may be usefully put to work; to convert it to facilitate transfer and use. What the consumer uses in his appliance is energy, in the case of light it is heat energy; of a motor, mechanical energy; in some cases, chemical energy, etc. "The principle of the conservation of energy is the fundamental assumption and the basis upon which the argument rests". "Electric energy is the connecting link or chain by which energy can be economically transmitted and effectively controlled".

> "In commercial systems the transmission line is not an independent unit, but merely a link between the generator and load circuits. Step-up and step-down transformers, generators and load circuits, lightning arresters and regulating devices, and all the apparatus necessary for the operation of the system are electrically interconnected into one unit" (R. 204).

The generator commences to perform its functions commercially after consumers are connected with the system. It is then controlled through a system of well conceived regulating devices.

> "The consumers' load actuates the controlling devices and they control the generator and the turbine.
>
> Consumers' devices at one end and generator at the other end must operate substantially integrally and synchronously in point of time to produce the desired result" (R. 204).

A generator does not create electric energy. Generation does not mean creation. It does generate voltage, and using the term in that sense, it becomes largely a matter of definition what is meant by "generate". But it does not create electric energy (R. 206).

From the foregoing it becomes apparent that the function of the so-called producer or manufacturer of electric energy is simply this—he provides an electro-magnetic path over which in conjunction with the consumer he transfers energy. As Dr. Langmuir says (R. 142):

> "The responsibility of the producer of power involves the maintenance of reasonably constant voltage and frequency at the point of connection with the consumer's circuits. To guarantee that this can be done involves the maintenance of generating, transmitting, and distributing equipment sufficient to meet the maximum demand which a consumer may require. That is, the power producing company must maintain constant voltage and frequency if and when the consumer draws the maximum amount of power that he is permitted to draw under the agreement with the company."

And this summary is acceded to by Dr. Magnusson, who says that the satisfaction of the consumer's demands rests with him, and the impulses set up by him, as closing a switch without interference by the company, as soon as the automatic regulating devices function in their proper manner. "That is, if the company maintains voltage and frequency, then it is up to the consumer to get his energy" (R. 207).

This scientific statement is confirmed by the actual practice of the appellant in its contracts which, as read into the record by Mr. Gadsby (R. 176-179) show that the company's obligations are to connect its lines to a point of contact with the consumers' similar lines and apparatus, and having done that, to maintain specified voltage and frequency. It is not to deliver to him a manufactured product or commodity, but to maintain a transportation circuit by which the consumer may draw energy directly from its source when and as required and without other act or interference by the company.

As said by Mr. Peek, and confirmed by Dr. Langmuir, as above quoted:

> "* * * the control and initiation of power rests at the load. Power cannot be transferred through a gener-

ator unless it is initiated by a load" (R. 186). The generator merely creates "a certain state of the electrical medium whereby it becomes possible for electricity that is already dormant to get into circulation and whereby it becomes possible for a useful load to draw energy from a distant waterfall" (R. 187).

In brief, a generating station does not generate or otherwise produce either electricity, electric current or electric energy. It generates or creates an electric pressure or voltage which, given an outlet through the system including the consuming devices attached to it, causes electricity to be set in motion; that is, an electric current to flow. This causes the *energy* previously present in its natural source, to flow if, as and when the consumer requires it, and by his act initiates the transfer.

Energy is drawn directly from its source, and not stored in the system:

This transfer, as shown by all the witnesses, is direct from the source of the energy. It is not from energy stored in the system either at the consumer's place of use or some intermediate point.

Mr. Peek says (R. 186):

"In a circuit that is alive with voltage or tension but otherwise inactive, with no power flowing, power flow is initiated at a load point, not at a generating point. For instance, when an electric lamp is turned on, an influence corresponding to demand for electric power appears instantly at its terminal and extends to the generating station. * * * Power cannot be transferred through a generator unless it is initiated by a load."

Dr. Langmuir says (R. 131):

"There is no practical way to store any appreciable amount of electrical power in an AC [alternating current] system. Storage batteries are charged with direct

current and the power of the direct current is transformed into chemical energy which later can be converted by the storage back into direct current electrical energy. * * * This is a storage of power, but not electrical power.

Dr. Millikan says (R. 113):

"What is actually done (in the storage battery) is to transfer electrical energy into the energy of chemical separation. Later when that storage battery is discharged the process is again a transfer from chemical energy into electrical energy. Even that kind of use, which is sometimes called storage, is not possible with an alternating current system, at least commercially. * * *

(R. 114):

"* * * the electrical system differs from a water main or gas pipe system with storage facilities from which the consumer may draw water or gas for a prolonged period from what is already in the main or pipe system. As I have already said in effect, the electrical system—that is the generators, lines and transformers—does not operate as a storage battery but as a device for the immediate transference of energy from its source in nature to its point of use when, as and if the consumer required it."

Dr. Magnusson confirms this in testifying to the synchronous and instantaneous transference of energy from generator to consumer (R. 204).

Reference is made both by Dr. Langmuir (R. 131), and Dr. Magnusson (R. 203, 207) to the minute storage which takes place in condensers and capacitors, but both agree that this storage (which accumulates and discharges 120 times a second) is negligible from the standpoint of storage accumulation. The function of these appliances is not to store energy as such but "to insure economical operation."

Function of transformers:

The function of transformers is described by Messrs. Millikan, Langmuir and Cheever. They show that they are gear-

ing devices to accomplish more efficient transfer of energy, like the gears in an automobile, or a series of belts with counter-shafts (R. 115, 116, 127, 148, 149).

In view of the error into which we think the South Carolina court fell, which we shall hereafter discuss, as to the scientific or technical function of transformers, we call particular attention to the testimony of Mr. Peek, the author of the article in the Encyclopedia Brittannica, on which that court based its decision. He says (R. 187, 188):

> "An electrical state is characterized with voltage and current. Different types of circuits require different values of voltage and current. Transformers are electrical links, making it possible to connect circuits of different voltage and current with each other. The real reason for using a transformer is an economic one; that is, they are not a necessity.
>
> A transformer consists of two or more windings coupled by a magnetic core, and insulated by a strong dielectric. The current and voltage of each winding are separate from those of the other winding or windings, but, by virtue of their coupling, current and voltage in one winding are said to induce corresponding current and voltage in another winding. Thus, if the switch of a load is closed, permitting a current to circulate in it and the transformer winding connected to it, this current induces a corresponding current in the winding connected to the generator, and a current flows through the generator.
>
> Insulation which separates the windings connecting the generator and load, respectively, is completely permeated by the intense electric and magnetic lines of force. Power entering one winding passes into this insulation through electro-magnetic fields, then into the other winding, and from it to the connected apparatus. *It is important to realize that although electric current cannot flow through the insulation of a transformer, electrical energy does flow right through it with perfect ease.* An analogy may be helpful. The walls of the tubes of a boiler in a power house segregate or insulate the water and steam from the coal and its flames and smoke. But the heat energy of the burning coal passes readily right through the walls of the tubes to the water.

The role which a transformer plays is similar to that of a set of reduction gears. Each gear has its own rotation (corresponding to electric circuits) separate from those of the other gears. Each gear has a different velocity (corresponding to current) and pressure (corresponding to tension) from those of the other gear. But energy flows from gear to gear without a break or gap in its path.

A transformer then transforms current and voltage, not power or energy. The latter flows right through its insulation without alteration."

Dr. Magnusson, for the respondents, does not disagree with, but confirms, this statement. He describes the transformer and its functions in much the same way as does Mr. Peek (R. 201, 202).

On cross-examination (R. 204) he confirms the statement in one of his books that "step-up and step-down transformers, generators and load circuits, lightning arresters and regulating devices, and all the apparatus necessary for the operation of the system are electrically inter-connected into one unit."

Further (R. 206) he says:

> "Energy passes directly from its source through these appliances, notwithstanding the interposition of transformers or anything else, direct to its destination"

Mr. Rupp, for the respondents, says (R. 214):

> "Q. You likened the transformer to a generator in certain respects in that, I believe, lines of force are cut in the transformer. That also is true in the motor?
>
> A. That is correct, and, in fact, this path for the transfer of electric energy, is not only electrical but also magnetic.
>
> And through the gaps of the transformer and the motor the energy travels in what we may term an electro-magnetic path."

In other words, the transformer acts (as do the generator and the motor) as a magnetic link in the electro-

magnetic path established for the transfer or flow of energy, and the energy flows directly through such path notwithstanding the interposition of transformers which vary inversely the current and the voltage, so that the same energy may be transferred more efficiently. It is the energy and not the current or the voltage which the consumer wants, and for which he is paying, and which is taxed by the Act under consideration.

Losses, or system uses:

The presence of the so-called losses in the system on account of which more energy leaves the generator than is delivered to the consumer, does not alter the fundamental nature of the process nor indicate any difference in the function of the generator than as above described. The system itself is a consuming device to the extent that it requires the transfer of certain energy from the source to enable the system to transfer energy to the consumer; to keep it electrically alive. They are system uses but are losses in a commercial sense because they are not specifically measured or billed to the consumer as part of the service to him. We do not quote all the witnesses specifically on this subject. It will be enough to quote from Dr. Langmuir for the appellant (R. 128, 129) and the respondents' witness, Dr. Magnusson (R. 201-205) as follows:

Dr. Langmuir says:

> "In order to maintain the whole electrical system in operating condition, it is necessary, for example, that the field coils of the generator shall be continuously excited. * * * Similarly, the action of the transformer requires that the iron of the transformer shall be magnetized. To maintain these magnetic fields requires the expenditure of * * * a relatively small fraction to the whole energy which is transmitted or generated.
>
> In a similar way to transmit electrical power over a transmission line requires the expenditure of a certain amount of electrical energy. There is, so to speak, a certain electrical friction when a current passes through

a wire. In order to maintain the flow of current, it is therefore necessary to have a certain electrical pressure to maintain this flow. This involves the expenditure of a certain amount of electrical power. This is really the use of electrical power for the purpose of transmitting the power over the line. It is usually referred to as a loss because it cannot be charged for by the power company. It should, however, really be regarded not as a loss but as the expenditure of electrical energy for the purpose of transmitting power over the line.

It is entirely analogous to the coal that would be consumed in a locomotive of a train which hauls coal from a mine to a distant point where the coal is consumed. The coal in the locomotive must be expended for the purpose of transporting the large amount of coal carried by the train."

Dr. Magnusson says:

"A. In any system, there are some losses. There are system losses, hysteresis losses, and so forth, corresponding and quite similar to friction losses in a mechanical machine.

These losses in the generator—the friction of the bearings, those due to magnetic hysteresis, and what is called copper losses, due to the resistance in the conductors."

(R. 204, 205):

"With respect to the uses or losses in the system, it is true that the system itself impresses on the generators a demand similar, so far as the generators are concerned, to the demands of consumers to satisfy these uses or losses.

And the generator, if you can imagine it as a sentient being, does not distinguish in performing its functions between the load that is created by the consumer and the load that is created by these so-called losses."

The kilowatt hour as a measure of use, and as energy in commerce:

As previously shown, Dr. Millikan defines the kilowatt hour as "a mathematical product of the power relation in the

electrical circuit between the generator and a receiving device" measured in kilowatts and hours. It is a measure of the relationship in power demand (kilowatts) between the consuming device and the generating station, and the duration in time of that relationship. It thus measures the magnitude of the demand made by the consumer on the electrical vehicle for the transfer of energy to him, and of the length of time during which that demand continues. *In short, in its very essence, it is a measurement of commerce in electric energy.*

Energy, as measured by kilowatt hours, is in commerce; that is, in the course of transfer from producer to consumer at the time of its measurement in kilowatt hours. This follows not only from the rate of speed at which the entire electric process functions (186,000 miles per second), but because of the very nature of the electric process, and the interdependence of the generator, transmission line and consuming device. The following are brief excerpts from the testimony:

Dr. Millikan says (R. 111):

> "It is not possible to have a measurable kilowatt hour generated except as we have that kilowatt hour used somewhere in the system attached to the generator.
>
> It is not possible to measure a kilowatt hour at any point in the electric circuit except as, if and when electric power is already in process of transference, and as we say, flowing over the wire."

Expressed somewhat differently, but to the same effect, Dr. Langmuir says (R. 133, 134, 136):

> "Since the kilowatt is a measure of power it is equivalent to mechanical power which is usually measured in horsepower. I say 'equivalent' in the sense that one can be converted into the other. However, the units are somewhat different so that actually a kilowatt is equivalent to about one and one-third horsepower of mechanical energy.
>
> Power measures the rate of doing work. Naturally, a consumer must pay not for the rate at which it does work, but the total amount of work done. That is, the

longer the time interval during which power is consumed, the greater amount he must pay. Therefore, as a practical unit of charge to measure the energy consumed, the kilowatt hour is adopted. If one kilowatt is consumed for one hour, this means that one kilowatt hour has been consumed. Or we might have one-half kilowatt for two hours, which would also be one kilowatt hour. In other words, the kilowatt hours represent the product of the time by the kilowatts.

You cannot measure a kilowatt hour at the generator or anywhere else upon the system except if, as, and when that kilowatt hour is delivered to and used by the consumer. * * *

At the generator the meters which measure kilowatt hours would show the total kilowatt hours consumed in the entire lines which would include the so-called losses along the line. But so far as kilowatt hours generated in response to consumers' demands are concerned they can be measured only if, as, and when they are actually demanded and consumed. The measurement is in kilowatt hours and that involves the measurement of current in amperes, voltage and time. It is the product of these three that determines the power consumed.

As I said before, no current can flow in one part of the system without involving current flow through other parts of the system. The recording of the kilowatt hours on the meter at the generator station is thus simultaneous with the consumption of the power at the other points along the line beyond the generating station. This is necessarily the case because there is no storage of electricity.

* * * * * *

Q. Assume that a power station is located in one State, that a transmission line extends directly from that station across the State line into another State, and that at the terminus of that transmission line there is a consumer who uses the power output of the station. Can any power be generated by that station in the first State other than again is required to keep the system under rotation and in charge except in response to and simultaneous with a demand and use by the consumer in the second State?

A. No. * * *

> The amount of power generated by the station in the first State is always equal to the amount consumed by the consumers in the second State, again allowing for the so-called system uses.
>
> It is not possible to measure a kilowatt hour of electricity or electrical energy at the generating station in the first State except if, as, and when that kilowatt hour is also passing over that State line and being delivered to and used by the consumer in the second State.

These statements are confirmed by Dr. Magnusson for the respondents, as follows (R. 205):

> "Meters at the generating station, or what the statute which we are considering in this case calls 'The place of production' are placed outside the generators, and that is the first place at which the energy transferred through the generators may be measured.
>
> While possibly for laboratory purposes you might measure it somewhere else, yet commercially it cannot be measured until that time.
>
> With respect to that energy which reaches the consumers, it is all in course of transit to consumers or, in fact, is being simultaneously, for practical purposes, received by them at the time of the measurements. These meters measure the energy flowing past the point at which the meter is connected. The measurement is in terms of kilowatt hours which is the unit for measuring electrical energy."

Likewise Mr. Rupp, for the respondents (R. 214), says:

> "And these meters to which we referred, measure the energy while it is in the course of such transit, and also, in fact, while it is actually being delivered to the consumer."

The Tax Act requires kilowatt hours to be measured at the place of production. The first practical point of measurement is on the cables or wires leading from the generator to the station bus, or direct to the transformers, if there be no bus.

As shown by the testimony previously discussed energy is transferred through the generator from the water fall, only in response to the consumer's demand and the demand of the

system itself for system uses. The amount so transferred is measured by this demand and becomes energy measurable in kilowatt hours only as the demand continues. The measurement takes place simultaneously with use and with the intervening transmission. It is implicit in the very nature of the process that energy measured in kilowatt hours, is in commerce when the measurement takes place. Therefore, the tax has its incidence after commerce has commenced, during the course of such commerce, and is measured by the amount of the commerce done.

Appellant's electric system operates in interstate commerce:

The argument thus far has been directed to the establishment of the fundamental proposition that the so-called generation of electric energy is an integral and inseparable part of the transfer of energy which constitutes commerce as distinguished from manufacture or production. If this commerce is carried on entirely within a state it is intrastate commerce; if carried on entirely between two states, interstate commerce, and if carried on in part within and in part without the state of origin it is intrastate commerce as to that part completed within the state, and interstate as to that part which requires integral and simultaneous action in two separate states to complete the process.

If this argument be accepted, we think it will not be disputed that the major part of appellant's operations constitute interstate commerce. These operations are described and the scientific testimony applied thereto in the testimony of Mr. Cheever, and of Messrs. Hale, Chief Engineer, and Gadsby, President of appellant company (R. 143, 157, 176).

No purpose would be served by quoting or narrating the testimony in detail. A diagrammatic map of the system is contained in R. 156. Briefly summarized, the testimony discloses the following:

The major part of the appellants' system in Idaho referred to as the "Bear River System" was constructed exclusively

and has always been used primarily for Utah service. This system consists of four hydro-electric plants on the Bear River in Idaho, with the Bear Lake Reservoir in the upper reaches of the river for the purpose of regulating the flow of the stream, connected to a central sub-station near Salt Lake City, Utah, designated "Terminal" by three circuits of 130,000 volt transmission lines, and to a point near Logan City, Utah, by a 44,000 volt transmission line. While interconnections of this system have been made with smaller Idaho plants and distributing centers, this inter-connection has been secondary for the purpose of securing efficient and reliable service and the interchange of power and energy between the other Idaho plants and those of the Bear River System. The smaller Idaho plants are of capacity adequate to and normally do carry the entire Idaho load. Upwards of 98% of the energy of the Bear River plants is transmitted to Utah. The 130,000 volt lines over which the larger part of this energy is transmitted have no taps for Idaho service. The 44,000 volt line has one tap in Idaho for such service (R. 145-148, 163).

The commercial operations of appellant conform to the physical situation. The appellant has in Utah an inter-connected network of local plants, transmission and distributing lines which are directly or indirectly connected to Terminal sub-station. The power or energy originating on this part of the system is utilized in Utah service and in the aggregate is insufficient to supply such service. Consequently the residual load or demand of the Utah consumers impresses itself in the aggregate on the appellant's Idaho system, particularly the Bear River System by way of Terminal sub-station. Power or energy is "generated", or more accurately transferred, from the source at the Bear River stations in Idaho instantaneously in response to the aggregate consumers' demand expressed in Utah, communicated to the Bear River stations by way of Terminal. The system is under the control of a Dispatcher, but his function is limited to seeing that the system is maintained in readiness to respond to the consumers' demands. He does not "switch" the power or energy at Terminal from one consumer to an-

other. He merely directs the station operators to hold certain generators at the stations in readiness to anticipate the consumers' demands as they are automatically reflected in the system (R. 147-148, 152, 165-166, 172).

The appellant's contract with its consumers obligates the appellant to connect its lines and facilities to those of the consumer and to maintain voltage and frequency at the point of delivery. In other words, the company agrees to and does maintain the facilities by which the consumer may at his will procure the transfer of power and energy from its source for his use. Such power and energy so far as it may originate at a source in Idaho is transferred directly to the consumer by means of the facilities furnished by the company. The function of the company is to furnish a vehicle of transfer, and to so maintain it in operation that the consumer may accomplish the transfer if, as and when he requires it (R. 178-179).

The interstate transfer of energy over the appellant's system is at the rate of approximately 200,000,000 kilowatt hours per year and upwards (R. 67). The tax amounts to from approximately $100,000 per year upward (R. 68, 88). The burden of the tax is approximately 3.58 per cent of the gross sales value of the kilowatt hours delivered (R. 180).

Discussion of authorities:

The transmission and sale of electric energy across state lines is interstate commerce. *Public Utilities Commission of Rhode Island* v. *Attleboro Steam & Electric Company*, 273 U. S. 83.

In this case the court held that the Public Utilities Commission of Rhode Island could not regulate the rates to be charged for energy sold and delivered to another company for distribution in Massachusetts, because the transmission of such energy from one state to another is interstate commerce. In its opinion the court says (p. 90):

> "Plainly, however, the paramount interest in the interstate business carried on between the two companies is not local to either State, but is essentially national in

character. The rate is therefore not subject to regulation by either of the two States in the guise of protection to their respective local interests * * *."

If the regulation of the rates for which electric energy can be sold to a company distributing such energy in another state burdens interstate commerce, it must follow that the imposition of a tax upon the process which transmits that energy likewise burdens such commerce.

The commercial business of the appellant therefore in transmitting electric energy across the Idaho-Utah line to its "Terminal" substation for sale in Utah is interstate commerce. Whether such commerce extends beyond such substation is not involved in this case. There the demands of the Utah consumers, remaining unsatisfied after exhaustion of the energy supplied through the Utah generators, impress themselves as a consolidated aggregate demand on the appellant's Idaho generators. That the interstate business includes as an integral and inseparable part thereof, as distinguished from a prior and separable incident, the transfer of the energy from the stream through the generator and to the transmission line is established by the facts above discussed.

In *Idaho Power Company* v. *Thompson,* 19 Fed. (2nd) 547, a rate case, the question was raised of inclusion in the rate base of the cost of a generating unit constructed by the Idaho Power Company at American Falls for serving Utah Power & Light Company and of inclusion within the revenues of the Idaho Power Company from Idaho business of the money received by the Idaho Company from the Utah Company under the service contract. Separate opinions were written by Judge Dietrich (concurred in by Judge Rudkin) and by Judge Cushman. The latter opinion, however, was adopted as the opinion of the court. In that opinion (p. 586) Judge Cushman said:

"As pointed out, the majority of the court excluded from the rate base the cost of the unit constructed at American Falls for serving the Utah Power & Light

Company, but have allowed as an item of revenue of the amount received upon the contract with this Company $22,000.00 per annum. I am unable to agree to the inclusion in the revenue of plaintiff's any part of its receipts from this contract, because supplying the Utah company over the lines of the two companies with electric power at Salt Lake City is interstate commerce. No question is made but that power directly delivered from one state to another constitutes interstate commerce. It is difficult to conceive of anything passing more directly to its destination than electric power."

The tax imposed by the Tax Act under review is a license tax exacted of appellant as a condition of continuing its business. The title of the Act so describes it. It is made payable monthly. Failure to pay it subjects the so-called producer to treble damages and injunction restraining further production of electric energy until it is paid. It is for revenue and not for regulation as the amount therefor is substantial (as applied to appellant upwards of $100,000 per year) and the taxes collected under the Act reduce the general *ad valorem* state taxes to all tax payers. It is measured by the amount of business done including the interstate business. It is similar in this respect to a tax on gross receipts, or on the tonnage of freight, the head of passengers, the tonnage of vessels, or on telephone or telegraph messages as such. If it be regarded as a tax on the kilowatt hour as property, it violates Sections 2 and 5 of Article VII of the Constitution of the State of Idaho in that it is not levied according to valuation, and is not uniform upon the same class of subjects, but is fixed arbitrarily. *Northern Pacific Ry. Co.* v. *Gifford,* 25 Idaho 196.

As thus applied to interstate business the tax falls within the condemnation of the decisions of this Court. In *Postal Telegraph Cable Company* v. *Adams,* 155 U. S. 688, the court, speaking by Mr. Chief Justice Fuller, said (pp. 695-6):

"It is settled that where by way of duties laid on the transportation of the subjects of interstate commerce, or on the receipts derived therefrom, or on the occupation

> or business of carrying it on, a tax is levied by a State on interstate commerce, such taxation amounts to a regulation of such commerce and cannot be sustained."

In this case the court sustained a tax on the property of the telegraph company measured by its mileage within the State and said:

> "Doubtless, no State could add to the taxation of property according to the rule of ordinary property taxation, the burden of a license or other tax on the privilege of using, constructing, or operating an instrumentality of interstate or international commerce or for the carrying on of such commerce; but the value of property results from the use to which it is put and varies with the profitableness of that use, and by whatever name the exaction may be called, if it amounts to no more than the ordinary tax upon property or a just equivalent therefor, ascertained by reference thereto, it is not open to attack as inconsistent with the Constitution."

But the tax here involved is not a tax on property or in lieu of a tax on property. It is expressly in addition to all other taxes, and, as above shown, is in form a license tax for the privilege of conducting the business of appellant, being assessed without reference to value, and at a unit rate upon the commerce which flows from the use of the property. It is similar to a tax on the ton of freight considered in the *State Freight Taxes,* 15 Wall. (U. S.) 232, or upon the passengers carried as in the *Passenger Case;* 7 How. (U. S.) 283, or on the tonnage of vessels as in the *State Tonnage Cases,* 12 Wall. (U. S.) 204. In these cases, and all similar ones, a tax at the unit rate on transactions in commerce was held to be a tax on the unit,—a burden on the commerce,—and not sustainable as a tax on the privilege or franchise of conducting the business within the state.

In *Telegraph Co.* v. *Texas,* 105 U. S. 460, the court held that a tax of one cent on each telegraph message originating within the State of Texas could not be enforced as to those messages with a destination outside of the state, because such tax burdened interstate commerce. In discussing the

transmission by telegraph, after citing the State Freight Tax, Tonnage, Passenger, and similar cases, the court said (pp. 465-466):

> "The tax is the same on every message sent, and because it is sent, without regard to the distance carried or the price charged. It is in no respect proportionate according to the business done. If the message is sent the tax must be paid, and the amount determined solely by the class to which it belongs. If it is full rate, the tax is one cent, and if less than full rate, one-half cent. Clearly if a fixed tax for every two thousand pounds of freight carried is a tax on the freight, or for every measured ton of a vessel a tax on tonnage, or for every passenger carried a tax on the passenger, or for the sale of goods a tax on the goods, this must be a tax on the messages. As such, so far as it operates on private messages sent out of the State, it is a regulation of foreign and interstate commerce and beyond the power of the State. That is fully established by the cases already cited."

Similarly the tax on the kilowatt hour entering into commerce is a tax on the commerce, as is the tax on the message, the freight, the passenger, or the tonnage.

In *LeLoup* v. *Port of Mobile*, 127 U. S. 640, the court held void a city license tax upon telegraph companies doing business within the city which was based in part upon messages passing in interstate commerce. See also to the same effect *Western Union Telegraph Company* v. *Alabama*, 132 U. S. 472.

While the Act by its terms attempts to levy a tax upon "electric energy generated, manufactured or produced," it has been repeatedly held that neither the form of the Act, nor the manner in which it is construed or characterized, are determinative of whether or not the same burdens interstate commerce. The practical operation and effect of the Act govern. *Foster Packing Co.* v. *Haydel, infra,* and cases therein cited.

The Tax Act describes the process as "generation, manufacture or production", but as shown by the testimony, elec-

tric energy cannot be generated, manufactured or produced except as it is transmitted and used. Generation, transmission and use occur simultaneously and are interdependent. No one can exist without the other. That part of the process which is described as generation is the part which is responsible for and causes the movement of the energy. It is the operation of the generator which causes the electric energy to travel in commerce. The generator is therefore an instrumentality of commerce. The generator cannot function unless it is connected to transmission lines over which energy may flow from it to other appliances by which the energy may be used. The tax on generation is necessarily a tax on transmission and on use. They are inseparable. What burdens one part of the process burdens the whole. Certainly if this tax by its terms were on kilowatt hours transmitted it could not be sustained as to energy transmitted in commerce and yet that is exactly what this tax is. It is this inseparability (which is not merely accidental or contrived for commercial facility or convenience but is inherent and integral) which characterizes the entire process as commerce. In *Foster Packing Company* v. *Haydel*, 278 U. S. 1, the court, through Mr. Justice Butler, said (p. 10):

> "One challenging the validity of a state enactment on the ground that it is repugnant to the commerce clause is not necessarily bound by the legislative declarations of purpose. It is open to him to show that in their practical operation its provisions directly burden or destroy interstate commerce. *Minnesota* v. *Barber*, 136 U. S. 313, 319. *Brimmer* v. *Rebman*, 138 U. S. 78, 81. In determining what is interstate commerce, courts look to practical considerations and the established course of business. *Swift and Co.* v. *United States*, 196 U. S. 375, 398. *Lemke* v. *Farmers Grain Co.*, 258 U. S. 50, 59. *Binderup* v. *Pathe Exchange*, 263 U. S. 291, 309. *Shafer* v. *Farmers Grain Co.*, 268 U. S. 189, 198, 200. Interstate commerce includes more than transportation; it embraces all the component parts of commercial intercourse among States. And a state statute that operates directly to burden any of its essential elements is invalid."

If an injunction were granted to restrain "production", for non-payment of the tax as provided in section 8 of the Act, it would immediately and necessarily stop transmission to Utah, and use in Utah; the consumer's motors would cease to operate with the generator. The entire system would be dead. In other words the tax must be paid or commerce ceases. This concert of action between instrumentalities in different states required to produce the result is the basis of the recent decisions of the lower Federal Courts in the *Radio* cases.

In the case of *Station WBT* v. *Poulnot,* 46 Fed. (2nd) 671, the State of South Carolina attempted to levy a license tax on radio receiving sets. The court said (pp. 675-6):

> "In other words, the receiving sets are absolutely essential instrumentalities of the interstate commerce in which the plaintiff is engaged. * * *
>
> "The tax in question cannot be sustained under those cases which hold that the state has a right to impose an *ordinary* property tax upon property having a situs within its territory and employed in interstate commerce; for here the tax is not a general property tax, but a license tax for the privilege of using an instrument of interstate commerce. Nor can it be sustained as a matter of local regulation, for the subject is national, and admits only of one uniform system or plan of regulation. Nor can it be sustained as a police regulation with an incidental tax to pay the expenses of the regulation, for it has no elements of police, and, moreover, the tax is frankly devoted to the uses of a state institution. Nor can it be sustained as in aid of interstate commerce, nor on the ground that its effect is merely incidental. The tax here is directly laid upon a necessary instrument of interstate commerce, imposes a burden upon that commerce, and the act of the Legislature imposing it is therefore in conflict with the Constitution of the United States, and null and void."

In *United States* v. *American B. & M. Co.,* 31 Fed. (2nd) 448, the power of the Federal Radio Commission was challenged on the ground that it attempted to interfere with

private business, touching subjects not within interstate commerce. The act was sustained and the court held that both broadcasting and reception are interstate commerce. The court said (p. 454):

> "It does not seem to be open to question that radio transmission and reception among the states are interstate commerce. To be sure it is a new species of commerce. Nothing visible and tangible is transported. There is not even a wire over which 'ideas, wishes, orders, and intelligence' are carried. A device in one state produces energy which reaches every part, however small, of the space affected by its power. Other devices in that space respond to the energy thus transmitted. The joint action of the transmitter owned by one person and the receiver owned by another is essential to the result. But that result is the transmission of intelligence, ideas, and entertainment. It is intercourse, and that intercourse is commerce (citing cases)."

See also

> *Whitehurst* v. *Grimes*, 21 Fed. (2nd) 787;
> *Technical Radio Laboratory* v. *Federal Radio Commission* (App. D. C. 1929), 36 Fed. (2nd) 111.

A license tax upon telephone systems based upon gross receipts has been held void under the commerce clause if receipts from interstate business were attempted to be subjected to the tax.

In New Jersey Bell Telephone Company v. *State Board of Taxes etc.*, 280 U. S. 338, the state of New Jersey attempted to levy a tax against telephone and telegraph companies measured by the "gross receipts of their business in the state for the calendar year next preceding." It was urged by the State of New Jersey that this exaction was a franchise tax on intangible property and was justified as an exchange for the right which the company had of eminent domain and to occupy the streets and enjoy a regulated monopoly. The telephone company insisted that it was a license tax levied directly upon gross receipts from interstate as well as intra-

state commerce in addition to *ad valorem* taxes upon its real and personal property, and, therefore, repugnant to the commerce clause. The court, after holding that if the act burdens interstate commerce it is void, irrespective of the name given the act or the manner in which this burden is imposed, calls attention to the fact that the act under consideration was not for a police regulation nor exacted as a tax on property, neither was it that of a "proprietor demanding compensation for the use of its property, but as a sovereign imposing a tax for the support of government."

The court further said (p. 346):

> "* * * a State may not tax, burden or interfere with such commerce or tax as such gross earnings derived therefrom or impose a license fee or other burden upon the occupation or the privilege of carrying on such commerce, whatever may be the instrumentalities or means employed to that end."

And that (p. 349):

> "We think it very plain that the exaction is not a tax on property nor in substitution for or in lieu of a property tax. Within the rule heretofore applied in this Court the exaction is a direct tax on gross receipts derived from appellant's interstate commerce and, as to that part at least, is void." (Citing cases.)

A tax on the operation of motor vehicles which is intended for revenue and not as a police regulation or as compensation for the use of the highways is void as applied to vehicles operating in interstate commerce. Nor can it be sustained as an occupation tax when it does not appear "that it is imposed solely on account of the intrastate business; that the amount exacted is not increased because of the interstate business done; that one engaged exclusively in interstate commerce would not be subject to the imposition; and that the person taxed could discontinue the intrastate business without withdrawing also from the interstate business". *Sprout* v. *City of South Bend*, 277 U. S. 163, 171. Similarly

a mercantile license tax on a wholesale vendor of goods is void insofar as it is measured by a percentage of gross transactions in foreign commerce. *Crew Levick Co.* v. *Pennsylvania,* 245 U. S. 292.

In *Helson* v. *Kentucky,* 279 U. S. 245, it was held that a Kentucky tax upon gasoline sold or used within the state was void in so far as it applied to gasoline purchased in Illinois and used in Kentucky by a ferry boat operating between the two states. The court held that the boat was engaged in interstate commerce, that the gasoline which was used in carrying on the commerce was an instrumentality of interstate commerce, and that a tax on the use of the gasoline was a tax upon the commerce. After referring to numerous decisions, the court said through Mr. Justice Sutherland, at page 252:

> "The statute here assailed clearly comes within the principle of these and numerous other decisions of like character which might be added. The tax is exacted as the price of the privilege of using an instrumentality of interstate commerce. It reasonably cannot be distinguished from a tax for using a locomotive or a car employed in such commerce. A tax laid upon the use of the ferry boat, would present an exact parallel. And is not the fuel consumed in propelling the boat an instrumentality of commerce no less than the boat itself? A tax, which falls directly upon the use of one of the means by which commerce is carried on, directly burdens that commerce. If a tax cannot be laid by a state upon the interstate transportation of the subjects of commerce, as this Court definitely has held, it is little more than repetition to say that such a tax cannot be laid upon the use of a medium by which such transportation is effected. 'All restraints by exactions in the form of taxes upon such transportation, or upon acts necessary to its completion, are so many invasions of the exclusive power of Congress to regulate that portion of commerce between the States.'. *Gloucester Ferry Co.* v. *Pennsylvania, supra,* p. 214."

So, if this tax is attempted to be sustained as a tax for the privilege of using the generator, it becomes a tax "upon the use of one of the means by which commerce is carried on" and directly burdens that commerce. Viewed in that aspect, the generator is clearly an instrumentality of commerce and the tax is on the use of one of the means of conducting it.

Furthermore, the tax involved in this case falls, and has its incidence, after the energy has entered upon its interstate journey, and is measured by the amount of energy (kilowatt hours) actually in commerce. All the witnesses agree that the energy cannot be measured in kilowatt hours until it has left the generator and is on the way to the station bus, at which time it has already commenced its journey in commerce and is in fact being delivered to the user. It has been held, even as to natural or manufactured products susceptible to tax by the State before entering commerce, that such a tax imposed on the thing in commerce after commerce has commenced is void.

In *Eureka Pipe Line Company* v. *Hallanan*, 257 U. S. 265, and *United Fuel Gas Co.* v. *Hallanan*, 257 U. S. 277, oil and gas respectively in interstate pipe lines was held not subject to a state license tax based on a unit rate per barrel, or per thousand cubic feet insofar as such oil and gas were actually destined for points beyond the state. The oil and gas were held to be in interstate commerce from the commencement of the flow even though there were some local deliveries from the lines, and it was theoretically possible that the owners might change the destination of any of such oil or gas before it left the state. Even this theoretical possibility is not here present.

The principle governing these cases is clearly stated in the logging cases: *Coe* v. *Errol*, 116 U. S. 517; *Champlain Realty Co.* v. *Town of Brattleboro*, 260 U. S. 366; *Hughes Bros. Timber Company* v. *Minnesota*, 272 U. S. 469. From these cases it is clear that while the state may impose a tax on timber cut in one state for transportation to another, yet as soon as the transportation has actually started such tax

may not be imposed even though the logs are temporarily detained by a boom to await high water, or gathered in a lake or river to be loaded on vessels. The "at rest" doctrine has no application to the facts in this case.

So in this case, energy is in commerce *before it has left the* windings of the generator where it first appears in electrical form. In fact it has reached its destination and been retransformed to some other form of energy than electrical, before the meter can possibly integrate and record the kilowatt hours "generated" and simultaneously used. The energy is not only in commerce when it is taxed, but the kilowatt hour is in itself a measure of the magnitude and duration of such commerce, and the tax is on the energy in commerce at a unit rate, and not on the value of the energy before the commerce has commenced.

The Act, in Burdening Interstate Commerce, is Void in its Entirety Because No Provision is Made For The Separate Determination of Interstate and Intrastate Business.

As previously shown (*supra,* p. 39), the Tax Act involved in this case may only be sustained as a license tax. Therefore, if the tax is a burden on interstate commerce, it is void in its entirety.

There is no segregation in the Act of interstate and intrastate business, and no way is prescribed for a determination of intrastate and interstate generation of electricity, or measurement of the kilowatt hours. It has been universally held by this Court that if the statute is inseparable by its terms and by its legal operation and effect, the tax imposed upon both intrastate and interstate business fails. In *Crew Levick Co. v. Pennsylvania,* 245 U. S. 292, on page 297, the court, in discussing such a tax, says:

> "It operates to lay a direct burden upon every transaction in commerce by withholding, for the use of the State, a part of every dollar received in such transactions. That it applies to internal as well as to foreign commerce can-

not save it; for, as was said in case of State Freight Tax, 15 Wall. 232, 277, 'The State may tax its internal commerce, but if an act to tax interstate or foreign commerce is unconstitutional, it is not cured by including in its provisions subjects within the domain of the State.' That portion of the tax which is measured by the receipts from foreign commerce necessarily varies in proportion to the volume of that commerce, and hence a direct burden upon it."

The entire Act was held invalid.

In *Bowman* v. *Continental Oil Company*, 256 U. S. 642, the court held an act unconstitutional in so far as it interfered with interstate commerce, and declared the entire license tax void both as to intrastate and interstate business. On page 647, the court says:

"But with the license tax it is otherwise. If the statute is inseparable, then both by its terms and by its legal operation and effect this tax is imposed generally upon the entire business conducted, including interstate commerce as well as domestic; and the tax is void under the authority of *Leloup* vs. *Port of Mobile*, 127 U. S. 640, 647; *Crutcher* vs. *Kentucky*, 141 U. S. 47, 58-59; *Williams* vs. *Talladega*, 226 U. S. 404, 419; and other cases of that character."

If, in the case at bar, provision had been made, or were possible consistent with the terms of the Act, for determination of generation in intra-state commerce, as distinguished from inter-state, the case would have been different. In this respect also, the case is different from *Telegraph Co.* v. *Texas, supra*, wherein the court held the tax void on messages originating within the State of Texas for delivery in another state, while valid on that business done within the state. There again it is to be observed the Act was separable and the amount of the tax on the intrastate business could be determined with precision.

The Tax Act provides for an injunction against one "producing" electricity and electrical energy if he fails to pay the

tax. This feature of the Act is determinative of its inseparability. It clearly indicates that it was the intention of the Legislature which passed the Act to have it considered as a whole. It was held in *Leloup* v. *Port of Mobile,* 127 U. S. 640, that a general license tax on a telegraph company affects its entire business, interstate as well as domestic or internal, and is unconstitutional.

On page 647 the court says:

> "But it is urged that a portion of the telegraph company's business is internal to the State of Alabama, and therefore taxable by the State. But that fact does not remove the difficulty. The tax affects the whole business without discrimination. There are sufficient modes in which the internal business, if not already taxed in some other way, may be subjected to taxation, without the imposition of a tax which covers the entire operations of the company."

Many other cases, including *United States* v. *Reese,* 92 U. S. 214; *Allen* v. *Louisiana,* 103 U. S. 80; *Pollock* v. *Farmers Loan & Trust Co.,* 158 U. S. 601; *International Textbook Company* v. *Pigg,* 217 U. S. 91, announce the same doctrine, viz.: that if the act itself clearly covers interstate as well as intrastate business and is indivisible in its terms, it must stand or fall as a whole. The court cannot say, as it would have to say in this case, if it imposed the tax on intrastate business, that while the Legislature clearly intended to tax the 84 per cent of the electricity used in Utah, yet it also intended and devised some method to tax the relatively small amount used in Idaho, if the tax on the Utah use should fail. That no such result was contemplated by the Legislature is clear from reading the Tax Act.

Discussion of decision and opinion of the Statutory Court.

The theory of the court below in this case is shown by its findings, conclusions and opinion. It is as follows: The electric energy generated by the appellant in Idaho can be

measured at the various generating stations before it starts in transmission on its interstate journey to Utah and Wyoming (R. 59); that the conversion of energy to the electrical form is completed at the generator; that the kilowatt hour is a commodity which is produced in Idaho; that the transformer has the effect of changing electric energy; and that the consumer receives both electric current and electric energy (Finding of Fact V, R. 88-89). As a consequence of these views the court below held that the Tax Act in question does not burden interstate commerce (Conclusions of Law XI, R. 94). To these findings of fact and conclusions the appellant duly took exception and the appellant duly requested the court below to make findings and conclusions in accordance with its theory of the case, which we have hereinbefore set forth.

We think it will be apparent from an examination of the record that there is no evidence to support the findings and conclusions made by the court below, but that all the testimony supports without conflict the findings and conclusions requested by the appellant.

The court found with respect to the nature of the kilowatt hour (Finding of Fact V, R. 89):

> "That the kilowatt hour is a unit of measurement of a definite physical entity, and of a commercial commodity produced by plaintiff for transmission, delivery and sale to its customers * * *. It is not a measurement of a period of time nor of service."

The appellant requested a finding (Proposed Findings of Fact XV, R. 71) that:

> "The kilowatt hour, the usual unit for measuring energy in the electrical form is a mathematical product of the power relation in the electric circuit between the generating and receiving device measured in kilowatts, and the duration of time over which that relation is utilized, measured in hours."

This statement of fact which the court refused to find is compelled by the evidence in the record and there is nothing to sustain the court's contrary finding. All the evidence shows that an electric system is a vehicle for the transfer of energy and that a kilowatt hour is the measure of the use of that vehicle. It is not in itself a commodity either natural or manufactured nor is it a physical entity (Millikan, *supra*, pp. 21, 32; Langmuir, *supra*, p. 32; Magnusson, *supra*, p. 34).

The court also found (Findings of Fact V, R. 88) that:

> "The process of conversion to energy in the electrical form is completed at the generator and before the pulses of energy leave the generator in their flow to the station bus or transformer."

The testimony is to the effect that the electrical phase commences in the generator and is completed in the consumer's motor. Generator, transmission lines and motor must function integrally and synchronously as a unit to either cause or complete the process (Millikan, *supra*, pp. 21-22; Langmuir, *supra*, pp. 22-23; Magnusson, *supra*, p. 24).

The court also erred in its findings with respect to the function and operation of the transformer in an electric system. The court found (Findings of Fact V, R. 89, 90) that:

> "Because the electrical energy produced by plaintiff cannot be transmitted to Terminal station as the same electrical current and with the same voltage at which generated without a loss in transmission in the consumption by or loss of energy from the transmission line of substantially the greater part of the electrical energy generated, the transformers are interposed to produce a different current and higher voltage which may be transmitted without a similar loss or consumption. * * * The consumer receives and must receive both current and power and that the measurement of electrical power generated or delivered to the consumer is the product of current and voltage."

On the other hand the appellant requested the court to find (Proposed Findings of Fact XIX, R. 72):

> "That there is a marked distinction between electric current and electrical energy or power; that electric current is the carrier for electric power or energy; electric current is not used or consumed by the consumer, but returns again to the generator leaving behind the electric energy or power which is used or consumed by the consumer. Electric current is never bought or sold; it is the electrical energy which is purchased by the consumer."

We submit that all the evidence in the record sustains appellant's proposed findings on this point and does not sustain the findings made by the court. All the testimony of the scientists and engineers called as witnesses was to the effect that electric energy is not changed by the transformer. The function of the transformer is to induce current to flow at a higher or lower voltage, so that energy can be more economically transmitted, but the energy itself passes through the transformer uninterrupted and unchanged (Langmuir, *supra,* pp. 27-28; Peek, *supra,* pp. 28-29; Magnusson, *supra,* p. 29; Rupp, *supra,* p. 29). The consumer uses not electric current, but electric power or energy. Indeed in an alternating current system such as the appellant's the electric current flows continuously back and forth. If ammeters were placed at both ends of the consumer's motor they would show the same amount of current coming out as going in (Peek, R. 189; Rupp, R. 214). It is apparent that the findings of the court with respect to the function of transformers and the distinction between electric current and electric energy and the refusal of the court to find as requested by the appellant upon these matters is in direct conflict with all the evidence in the case.

The court held that electric energy generated by the appellant in Idaho can be measured at the generating stations before it starts in transmission on its interstate journey to Utah and Wyoming. We do not contend that electric en-

ergy cannot be measured at the generating stations. It can be and it is, But we do contend that at the time it is so measured it is actually in the process of transmission to another state. Indeed it is actually being used in another state. The court below apparently completely overlooked this distinction. The court in its opinion said (R. 59):

> "While there appear differences of opinion among the engineers and scientists as to whether the generation of electrical energy can be determined at the place of production and before it reaches the point of use, yet we are impressed with the view expressed by those who have testified that it can be measured and the amount accurately determined by the installation of meters or other proper instruments at the place of production and especially is that true when we consider the testimony of Mr. Hale, the Chief Engineer of the plaintiff, to the effect that in the operation of the system the plaintiff determines with accuracy its metered number of kilowatt hours of energy generated by it in Idaho at its various generating stations *and before it starts in transmission on its journey to Utah and Wyoming.*" (Italics ours.)

There is no difference of opinion among the engineers and scientists as to whether the generation of electric energy can be measured at the place of production, *i. e.* on the cables leading from the generator to the bus (R. 119; 205). They all agree that it can be measured there. The statement attributed to Mr. Hale (italicized) is entirely contrary to what he said. Mr. Hale testified (R. 168) that:

> "The aggregate power generated in Idaho must be simultaneously consumed in Utah and the measurements cannot take place at the generator or any other place on the system except at the power is being simultaneously used. The energy is passing over the state line between Idaho and Utah at the time the measurement takes place."

The testimony of the scientists and engineers called as expert witnesses is all to the same effect. We have already quoted (Millikan, *supra*, p. 32; Langmuir, *supra*, pp. 32-34;

Magnusson, *supra*, p. 34). For emphasis we repeat the quotation from respondents' own witness Dr. Magnusson (*supra*, p. 34):

> "With respect to that energy which reaches the consumers, it is all in course of transit to consumers or, in fact, is being simultaneously, for practical purposes, received by them at the time of the measurement. These meters measure the energy flowing past the point at which the meter is connected. The measurement is in terms of kilowatt hours which is the unit for measuring electrical energy."

Likewise Mr. Rupp, for the respondents (*supra*, p. 34), says:

> "And these meters to which we referred, measure the energy while it is in the course of such transit, and also, in fact, while it is actually being delivered to the consumer."

In holding that electric energy generated can be measured in kilowatt hours at the generating stations and that therefore it can be measured before interstate commerce commences, the court below apparently fails to understand what it is that is being measured. It makes no difference whether meters are placed at the generating stations or anywhere else along the line. What is measured by these meters, wherever placed, is the totality of the relationship of the power consuming devices in the electric system (including the demands of the system itself) as it exists at the point of measurement with the generator, and, if the kilowatt hour unit be used, the duration of time during which such relationship exists. Electric energy on appellant's system is and must be of necessity in interstate commerce when it is measured in kilowatt hours.

The cases which the court below relied upon as upholding the Tax Act in question are *Hope Natural Gas Co.* v. *Hall*, 274 U. S. 284; *Oliver Iron Co.* v. *Lord*, 262 U. S. 172; *Heisler* v. *Thomas Colliery Co.*, 260 U. S. 245; *American Manufacturing Company* v. *City of St. Louis*, 250 U. S. 459. In the case of *Hope Natural Gas Co.* v. *Hall*, the tax was

laid upon every person engaged in the business of producing natural gas in the state, and the Supreme Court of the state had held (102 West Virginia 272) that the gross proceeds of sales of gas outside the state could not be treated as the worth of the gas within the state, but that the Act could be enforced as to the value of the gas within the state before it entered interstate commerce. This Court held that the tax, as construed by the highest court of the state, was valid because based on the value of the gas at the well before entering commerce. Similarly in *Heisler* v. *Thomas Colliery Co., supra,* the tax was upon the value of coal mined within the state before it had entered commerce. In *American Manufacturing Company* v. *City of St. Louis, supra,* it was held that an ordinance of the city of St. Louis levying a tax upon manufacturers for a license to carry on a manufacturing business in the city was valid. The tax was measured by the amount of sales of the goods manufactured locally whether sold within or without the state. The court said: "In the outcome the tax is the same in amount as if it were measured by the sale value of the goods but imposed upon the completion of their manufacture. The difference is that, for reasons of practical benefit to the taxpayer, the city has postponed payment until convenient means have been furnished through the marketing of the goods."

In the case of *Oliver Iron Company* v. *Lord, supra,* this Court held a state statute imposing an occupation tax upon the business of mining measured by a percentage of the value of the ore mined to be valid. On pages 178-9, it is said:

> "Mining is not interstate commerce, but, like manufacturing, is a local business subject to local regulation and taxation (citing authorities). Its character in this regard is intrinsic, is not affected by the intended use or disposal of the product, is not controlled by contractual engagements, and persists even though the business be conducted in close connection with interstate commerce (citing authorities). The ore does not enter interstate commerce until after the mining is done, and the tax is imposed only in respect of the mining. No discrimination against interstate commerce is involved."

The generation, transmission and use of electric energy is exactly the converse of each proposition recited in *Oliver Iron Co.* v. *Lord, supra.* The character of the business of generation of electric energy is not "intrinsic" but extrinsic. It cannot be produced on appellant's system without a call from a distant state. It is "affected by intended use or disposal of the product" and "is controlled by contractual engagements." The generation is impossible without simultaneous use, and it is in interstate commerce instantaneously with its generation. It cannot be reservoired or stored. It cannot be prepared for "interstate commerce." Its generation is inseparable with its commerce. Further, as in the other cases cited, the tax was based upon the value of the ore at the mines, and not on the unit mined and shipped. In fact, an exact antithesis exists between the case at bar and the *Oliver Iron Co.* case, *supra,* and illustrates sharply the dividing line between the class of cases to which that case belongs and the case under consideration.

In all of these cases where it has been held that a tax upon the business of manufacturing or mining was not a burden upon interstate commerce, even though the goods manufactured or mined were later transported in interstate commerce, it appeared that the process of manufacturing or mining, and the instrumentalities used therein, were distinct and separate from the process of transporting, and the instrumentalities used therein. It could not be claimed in any of these cases that the process of manufacturing or mining, or the instrumentalities used therein, had the effect of causing the transportation of the goods, or that they were a means or medium by which the commerce was carried on. In order to cause the goods to be transported, it was necessary to apply new processes and new instrumentalities which were entirely different from those which had been used in manufacturing or mining the goods.

East Ohio Gas Company v. *Tax Commission,* 283 U. S. 465, might be also cited to emphasize the distinction between the cases in which taxes of this kind have been sustained from

those in which they have been condemned. That case, unlike this case, involves the question of when interstate commerce ends, not when it begins. But the court there held that gas transported from another state loses its interstate character at the point where it is relieved from the pressure of the transmission mains, and expanded in volume in the many distribution pipes in which it rests for withdrawal by consumers. It is to be observed that gas is a commodity subject to storage, and is drawn by the consumers in the first instance immediately from the pipes, and not as in an electric system directly from the original source of supply of the energy.

South Carolina Power Company v. *South Carolina Tax Commission*, 52 Fed. (2nd) 515, and two other cases decided therewith (Nos. 542, 566 and 567), now under review with this case, involve the same error as in this case, in regarding the tax imposed as a tax upon the production of an article for transmission in interstate commerce. Instead as we have pointed out above, it is a tax upon the commerce itself, and the analogy is to the railroad, telegraph, telephone and radio cases, and not to manufacturing and production cases. The other error in the South Carolina court's decision is similarly based upon a misunderstanding of the terms used in the art with respect to the function of transformers. The South Carolina Court said (p. 524):

> "And this 'stepping-up' or 'stepping-down' is not a mere change produced in the current. It is the production of a new and different current * * *."

And at page 525

> "* * * it clearly appears that the current generated in South Carolina, upon which the tax is imposed, is not the current transmitted in interstate commerce. The current upon which the tax is imposed is the generated low-voltage current; the current transmitted in interstate commerce is the high-voltage current induced in the transformers of the company."

But electric current is not what is generated (it is merely caused to flow so as to effect the transportation of energy)

nor what the consumer uses; nor what is taxed. What is delivered to the consumer, what is used and what is taxed, is electric energy, and the flow of electric energy is continuous in the electro-magnetic path from its source to its destination. The flow of electric energy is not interrupted by transformers, but it flows directly through them without interruption or alteration (Peek, Magnusson, *supra*, pp. 28-29). It must be remembered that the tax in the case at bar is not a tax on electric current. It is a tax upon "electric energy." It is measured by kilowatt hours which can only measure electric energy, not electric current which is measured in amperes.

Thus the South Carolina court and the court below both fell into a similar error in assuming that electric current is the same as electric energy, that the process of generating such energy is separable from the process of transmitting it, and that electric energy may be measured prior to and separate from its transportation in commerce. The undisputed testimony in this case shows that these assumptions are erroneous.

In conclusion, we submit that the entire electric system is an instrumentality of commerce, unitary in its operation, and not susceptible to artificial segregation into parts for purpose of taxation. The entire system operates together to create and make possible commerce in electric energy. The kilowatt hour is the measure of such commerce. The tax on the kilowatt hour generated is a tax on energy then being transmitted in commerce measured in kilowatt hours, and upon the use of the instrumentality which causes it to move in commerce.

II.

POINT.

The Tax Act denies appellant equal protection of the laws and deprives it of property without due process in violation of the Fourteenth Amendment to the Constitution of the United States, and Section 13 of Article I of the Constitution of the State of Idaho, in that Section 5 of said Act compels the appropriation and payment of money by appellant for the benefit of private individuals, and for the same reasons violates Section 2 of Article VII and Section 2 of Article VIII of the Constitution of Idaho in that it levies a tax for other than for a public purpose, to wit: for the benefit of individuals, and violates Section 6 of Article VII of the Constitution of Idaho in that it imposes a tax for the benefit of municipal corporations, to wit: irrigation districts.

Authorities.

14th Amendment to the Constitution of the United States.
Article I, Section 13 of the Constitution of Idaho.
Article VII, Section 2 of the Constitution of Idaho.
Article VII, Section 6 of the Constitution of Idaho.
Article VIII, Section 2 of the Constitution of Idaho.
Jones v. *City of Portland,* 245 U. S. 217.
Citizens Savings, etc. Ass'n. v. *Topeka,* 20 Wall. (U. S.) 655.
Missouri Pac. R. Co. v. *Nebraska,* 164 U. S. 403.
Sharpness v. *Mayor, etc. of Philadelphia,* 21 Pa. 147.
Cole v. *City of La Grange,* 113 U. S. 1.
Ferguson v. *Ill. Cent. R. Co.,* 202 Ia. 508.

St. Louis-San Francisco Ry. Co. v. *State*, 118 Okla. 89.
Eyers Woolen Co. v. *Town of Gilsum*, 84 N. H. 1.
Bevis v. *Wright*, 31 Idaho 676.
Williams v. *Baldridge*, 48 Idaho 618.
Nicchia v. *New York*, 254 U. S. 228.
Pioneer Irrigation District v. *Walker*, 20 Idaho 605.
Guy v. *Baltimore*, 100 U. S. 434.
Darnell & Son v. *Memphis*, 208 U. S. 113.
Johnson v. *Southern P. Co.*, 196 U. S. 1.
Sullivan v. *City of Butte*, 65 Mont. 495.
Connolly v. *Union Sewer Pipe Company*, 184 U. S. 540.
Howard v. *Illinois C. R. Co.*, 207 U. S. 463.
Dorchy v. *Kansas*, 264 U. S. 286.
Lemke v. *Farmers Grain Company*, 258 U. S. 50.
Williams v. *Standard Oil Company of Louisiana*, 278 U. S. 235.

Summary.

(1) Both the Fourteenth Amendment to the Constitution of the United States and Article I, Section 13 of the Constitution of Idaho prohibit that state from depriving any person of property without due process of law. Other sections of the Constitution of Idaho prohibit taxation for private benefit, or for the benefit of political subdivisions of the state (*infra*, pp. 62-63).

(2) Section 5 of the Tax Act uses the power of taxation for the purpose of granting a subsidy to users of electric energy for irrigation pumping by requiring a credit upon their bills of an amount equal to the tax otherwise payable on such energy (*infra*, pp. 63-64).

(3) This is a use of the power of taxation for private, as distinguished from public purpose, and is void under the

Fourteenth Amendment, and other constitutional provisions cited. *Jones* v. *City of Portland, supra; Citizens Savings Ass'n.* v. *Topeka, supra,* and other cases cited (*infra,* pp. 64-70).

(4) If this section is unconstitutional for the reasons above stated, the Act must fall in its entirety. (a) The history of its passage shows that this so-called exemption, or subsidy, was inserted to secure its passage, and it would not have been passed unless it were inserted. (b) Exemption features of statutes inserted to favor certain individuals, or industries, in order to secure their passage cannot be excluded by judicial interpretation, and their invalidity carries with it the entire Act of which they are a part. *Connolly* v. *Union Sewer Pipe Co., supra; Howard* v. *Ill. C. R. Co., supra* (*infra,* pp. 70-72).

(5) This view is not affected by that section of the Act, which provides that if any section, or provision thereof, be adjudged unconstitutional, such adjudication shall not affect the validity of the Act as a whole, or any other section thereof. Such a provision merely raises a presumption in favor of the validity of the balance of the Act, and is not a command to the judiciary, if it appears that, in fact, the Act as a whole cannot be sustained and carried out without changing the legislative intent. *Dorchy* v. *Kansas, supra; Lemke* v. *Farmers Grain Co., supra; Williams* v. *Standard Oil Co., supra* (*infra,* pp. 72-74).

Argument.

Both the Fourteenth Amendment to the Constitution of the United States and Article I, Section 13 of the Constitution of Idaho prohibit that state from depriving any person of property without due process of law.

Article VII, Section 2 of the Idaho Constitution provides:

> "The Legislature shall provide such revenue as may be needful by levying a tax by valuation so that every

person or corporation shall pay a tax in proportion to the value of his, her or its property except as in this Article hereinafter otherwise provided. * * *"

Section 6 of this Article provides:

"The Legislature shall not impose taxes for the purposes of any county, city, town or other municipal corporation but may, by law, invest in the corporate authorities thereof respectively the power to assess and collect taxes for all purposes of such corporation."

Article VIII, Section 2 provides:

"The credit of the state shall not in any manner be given or loaned to or in aid of any individual, association, municipality or corporation nor shall the state directly or indirectly become a stockholder in any association or corporation."

While these constitutional provisions have distinct objects, the underlying principles involved in so far as they affect powers of taxation, and the facts which give rise to their application in this case, are the same.

As applied to the problem here presented, these provisions of both federal and state constitutions prohibit the use of the power of taxation for private as distinguished from public purposes, and the provisions quoted from Articles VII and VIII of the Idaho Constitution prohibit the use of the state's taxing power for the benefit of either private persons or corporations or of political subdivisions of the state. If a part of the tax levied by the Tax Act accrues not to the public treasury but to private benefit, the Act offends both the Fourteenth Amendment to the federal Constitution and the corresponding provisions of the state Constitution. If a further portion of the tax accrues to the benefit of municipal corporations, viz., public irrigation districts, the Act further offends the other provisions of the Idaho Constitution above quoted.

These questions are raised by Section 5 of the Tax Act.

We quote the Section in full:

> "SEC. 5. All electricity and electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho is exempt from the provisions of this Act, except in cases where the water so pumped is sold or rented to such irrigated lands. Provided, the exemption here given shall accrue to the benefit of the consumer of such electricity or electrical energy. Provided further that the full amount of such license tax which would have been due from such producers of electricity and electrical energy, if such exemptions had not been made, shall be credited annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity and electrical energy, furnishing such power, and such producer shall include a statement of the amount of electricity and electrical energy exempted by this section, furnished by it for the purpose of pumping water for irrigation purposes on lands in the State of Idaho, to the commissioner of Law Enforcement of the State of Idaho as a part of the statement required by Section 1 of this Act, together with a statement of the credits made on the power bills to the consumers of such electricity and electrical energy for the pumping of water for irrigation to be used on lands in the State of Idaho."

The practical application of this provision to appellant is described by Hale (R. 167) and Gadsby (R. 181). For the last year for which figures were available 6,838,000 kilowatt hours were measured as delivered to irrigation consumers. The energy measured at the generator required to supply this use would be in excess of this by an indeterminate amount up to 20%. If the so-called exemption is to be applied to the delivered energy the tax would be approximately $3,400 per year. Appellant in paying the license tax monthly would in effect deduct from the tax otherwise payable the portion of this amount accruing during the preceding month. At the end of the season appellant would credit, pro rata according to use, to its irrigation customers on their bills for energy for the season, the amount so deducted from the monthly tax bills.

The purpose and effect of this provision is to take the producer's money and give it to favored consumers, the irrigation pumping farmers. It is clear that the credit is for private and not for public benefit. The so-called exemption is not such, but is a forced donation by one taxpayer to another. It is fundamental that the power of taxation cannot be used for the raising of money other than for public purposes; and it is equally true that private property cannot be taken for private purposes.

Jones v. *City of Portland*, 245 U. S. 217.

In *Citizens Savings Etc. Ass'n.* v. *Topeka*, 20 Wall. (U. S.) 655, this Court said (p. 664):

> "To lay with one hand the power of the government on the property of the citizen, and with the other to bestow it upon favored individuals to aid private enterprises and build up private fortunes, is none the less a robbery because it is done under the forms of law and is called taxation. This is not legislation. It is a decree under legislative forms.
>
> Nor is it taxation. 'A tax,' says Webster's Dictionary, 'is a rate or sum of money assessed on the person or property of a citizen by government for the use of the nation or state.' 'Taxes are burdens or charges imposed by the legislature upon persons or property to raise money for public purposes.' Cooley, Const. Lim., 479."

Similarly in *Missouri Pac. R. Co.* v. *Nebraska*, 164 U. S. 403 (p. 417):

> "The taking by a State of the private property of one person or corporation, without the owner's consent, for the private use of another, is not due process of law, and is a violation of the Fourteenth Article of Amendment of the Constitution of the United States."

In *Sharpness* v. *Mayor, etc., of Philadelphia*, 21 Pa. 147, the Supreme Court of Pennsylvania said (p. 168):

> "Neither has the legislature any constitutional right to create a public debt, or to lay a tax, or to authorize any municipal corporation to do it, in order to raise funds for a mere *private* purpose. No such authority passed to the Assembly by the general grant of legislative power. This

would not be legislation. Taxation is a mode of raising revenue for *public* purposes. When it is prostituted to objects in no way connected with the public interests or welfare, it ceases to be taxation, and becomes plunder. Transferring money from the owners of it, into the possession of those who have no title to it, though it be done under the name and form of a tax, is unconstitutional for all the reasons which forbid the legislature to usurp any other power not granted to them."

In *Cole* v. *City of La Grange,* 113 U. S. 1, this Court said (pp. 7-8):

> "The express provisions of the Constitution of Missouri tend to the same conclusion. It begins with a Declaration of Rights, the sixteenth article of which declares that 'no private property ought to be taken or applied to public use without just compensation.' This clearly pre-supposes that private property cannot be taken for private use. * * * Otherwise, as it makes no provision for compensation except when the use is public, it would permit private property to be taken or appropriated for private use without any compensation whatever. It is true that this article regards the right of eminent domain, and not the power to tax; for the taking of property by taxation requires no other compensation than the taxpayer receives in being protected by the government to the support of which he contributes. But, so far as respects the use, the taking of private property by taxation is subject to the same limit as the taking by the right of eminent domain. Each is a taking by the State for the public use, and not to promote private ends.

See also

Ferguson v. *Ill. Cent. R. Co.,* 202 Ia. 508;
St. Louis-San Francisco Ry. Co. v. *State,* 118 Okla. 89;
Eyers Woolen Co. v. *Town of Gilsum,* 84 N. H. 1.

The Supreme Court of Idaho in *Bevis* v. *Wright,* 31 Idaho 676, recognizes this principle. Quoting authorities to the effect that taxes may only be levied for public purposes and that a tax imposed for an object in its nature essentially private is void, the court sustained the tax involved (for ex-

hibition of products at domestic and foreign exhibitions for the purpose of encouraging immigration) as having been levied for a public purpose.

Thus, the Supreme Court of Idaho has very clearly laid down the rule that tax moneys may not be appropriated for private purposes. If Section 5 of the Tax Act is to be sustained, it is equivalent to holding that the legislature may do indirectly that which it may not do directly. If the State may not devote its own money to private purposes, what valid reason is there for holding that the State may decree the use of private money for private purposes? Since the money to be credited under Section 5 is not tax money, because of the exemption feature of Section 5, it must remain private money. The question, therefore, is whether or not the State may take private money for private purposes without compensation. We have failed to find any authority which justifies such confiscatory legislation.

The principle involved in the credit provisions of Section 5 is of paramount importance. Its possibilities, if approved by this Court, are startling. It affords a method "to lay with one hand the power of the government on the property of the citizen and with the other to bestow it upon favored individuals to aid private enterprises and build up private fortunes"—a thing, which this Court has held, cannot be constitutionally done.

Citizens Savings Etc. Ass'n. v. *Topeka, supra.*

We are not unaware that the Supreme Court of Idaho has passed upon the question of exempting physical property used for irrigation pumping purposes from a general property tax in the case of *Williams* v. *Baldridge,* 48 Idaho 618. However, the point that we are relying upon here was specifically reserved from decision there, since the plaintiffs in that case (who were not the companies concerned) had no standing to raise them, and, on this point, the court said (p. 631):

> "Appellants' fourth and last point is that taking the funds resulting from the exemption from the Idaho Power Company, and giving it to the irrigationists is

depriving the power company of its property without just compensation in violation of Section 13 of Article I of the Idaho Constitution and the Fourteenth Amendment of the Constitution of the United States.

"As indicated in the discussion with reference to appellants' first point, they do not show that they are in a position to urge this contention; hence it becomes unnecessary to pass upon the same."

The statutory court completely overlooked this reservation of decision by the Idaho Supreme Court, and (R. 26) cites *Florida Central, etc. R. Co.* v. *Reynolds,* 183 U. S. 471; *Bell's Gap R. Co.* v. *Pennsylvania,* 134 U. S. 232 in support of its holding on the so-called exemption feature of the Act. These cases, however, have nothing whatever to do with a credit provision similar to Section 5. Nor is such provision to be confused with a police measure containing a license tax as a part thereof, such as was considered in *Nicchia* v. *New York,* 254 U. S. 228. This case only serves to emphasize the illegality of such a credit provision. The court below also considered this question as one entirely of state law. Assuming *Williams* v. *Baldridge, supra,* to be controlling, it said (R. 26): "the federal court will not interfere in the matter of exemption from state taxation under the Fourteenth Amendment as such matters of classification are of state policy to be determined by the state." But our contention is not one of classification and exemption under state law, but of a fundamental violation of the due process clause of the Federal Constitution, through unlawful taking of property for private use, and decision of that contention is expressly reserved by the Supreme Court of Idaho in the case cited.

With respect to the inhibition of Article VII, Section 6 of the Idaho Constitution, an irrigation district organized under the state law as a quasi-public corporation with its own power of assessment and taxation for the purpose of irrigating lands within the district, has been held to be a municipal corporation for which the state may not levy taxes. *Pioneer Irrigation District* v. *Walker,* 20 Idaho 605.

That the appellant furnishes electric energy for such districts which are entitled to the benefits of this so-called exemption and actual subsidy, if the same is valid, is alleged in the Bill of Complaint (Paragraph 15) (R. 12) and is not denied by the Answer, which merely denies that the Act is invalid for the reason assigned (Paragraph 15) (R. 53).

However, there is no reason to discuss further this particular section of the Idaho Constitution, or its application to the Act under consideration. If the section grants a private subsidy at appellant's expense, as we contend, and is not a true exemption, it is void under the due process clauses of the federal and state constitutions, and as a tax for private instead of public purposes, and further grounds of invalidity are unimportant.

But this provision of the Act presents further difficulties not only under the due process clause, but under the commerce clause of the Constitution. The exemption, if it be otherwise valid, extends to electric energy used to pump water for lands in Idaho. No similar exemption is given for electric energy similarly used in Utah, hence, if it be otherwise valid, it results in a denial of due process and equal protection, and also a direct discrimination against interstate commerce, in that the same energy generated and transmitted for irrigation pumping is taxable or exempt according as its destination is Idaho or Utah. This problem is actually presented in appellant's system.

Mr. Gadsby, the appellant's president, says:

> "One company connected with our lines and pumping water in Idaho, irrigates land in both Idaho and Utah. Our company has no knowledge, or means of obtaining knowledge, of the amount of land so irrigated in either state, and could not determine the proportionate power used at its pumping plant for irrigating land in Idaho." (R. 180, 181).

The chief engineer, Mr. Hale, testifies to the same effect (R. 167, 168).

This energy has been generated and transmitted to a pumping station located in Idaho for border lands in the two states,

and is "exempted", or not, according as the land actually irrigated is in one state or the other.

It is well settled that a discrimination against interstate commerce makes a tax act invalid.

Guy v. *Baltimore*, 100 U. S. 434;
Darnell & Son v. *Memphis*, 208 U. S. 113.

If Section 5 is unconstitutional for the reasons hereinbefore stated, the Act must fall in its entirety.

As shown by the affidavit of Secretary of State Lukens, included by stipulation in the testimony (R. 99, 104), the regular session of the Idaho State Legislature had before it House Bill No. 44, introduced on January 29, 1931. This bill, as amended during its progress, became substantially identical with the Tax Act as passed at the Extraordinary Session, except that it did not contain this controverted Section 5. It was before the House until March 5, 1931, when it was withdrawn (R. 101). The Tax Act in its present form, with Section 5 included, was introduced at the Extraordinary Session and passed (R. 103, 104).

We may fairly assume from this legislative history that the Act would not have been passed had the exemption and credit provisions of Section 5 not been included. We may properly refer to this history, since legislative journals may be examined to assist in determining the importance of Section 5 in the legislative scheme.

Johnson v. *Southern P. Co.*, 196 U. S. 1.
Sullivan v. *City of Butte*, 65 Mont. 495.

But irrespective of the argument based on this legislative record, Section 5 may not be removed from this Act in whole or in part without doing violence to the whole legislative intent. It is quite apparent that the exemption and credit provisions were essential to the legislative scheme, and that irrigation pumping service was not to be burdened with the tax. If the exemption is maintained and only the credit eliminated, the appellant secures an exemption which the Legislature did not intend to grant. If both are elimi-

nated irrigation service is subjected to a burden from which it was expressly intended to be exempt. The court cannot say what the legislative intent was, if the credit be eliminated, and any judicial construction becomes judicial legislation.

The rule which we invoke in this case is that the unconstitutionality of Section 5 carries with it a condemnation of the entire Act, for the reasons expressed in *Connolly* v. *Union Sewer Pipe Company*, 184 U. S. 540, passing on an Illinois statute declaring certain business combinations illegal, but exempting agriculturists and live stock dealers.

The court said (pp. 564-5):

> "We therefore hold that the Act of 1893 is repugnant to the Constitution of the United States, unless its ninth section can be eliminated, leaving the rest of the act in operation.
>
> "The principles applicable to such a question are well settled by the adjudications of this court. If different sections of a statute are independent of each other, that which is unconstitutional may be disregarded, and valid sections may stand and be enforced. But if an obnoxious section is of such import that the other sections without it would cause results not contemplated or desired by the legislature, then the entire statute must be held inoperative. The first section of the act here in question embraces by its terms *all* persons, firms, corporations or associations of persons who combine their capital, skill or acts for any of the purposes specified, while the ninth section declares that the statute shall not apply to agriculturalists or livestock dealers in respect of their products or stock in hand. If the latter section be eliminated as unconstitutional, then the act, if it stands, will apply to agriculturalists and livestock dealers. Those classes would in that way be reached and fined, when, evidently, the legislature intended that they shoud not be regarded as offending against the law even if they did combine their capital, skill or acts in respect of their products or stock in hand. Looking then at all the sections together, we must hold that the legislature would not have entered upon or continued the policy indicated by the statute unless agriculturalists and livestock dealers were excluded from its opera-

tion and thereby protected from prosecution. The result is that the statute must be regarded as an entirety, and in that view it must be adjudged to be unconstitutional as denying the equal protection of the laws to those within its jurisdiction who are not embraced by the ninth section."

Later in *Howard* v. *Illinois C. R. Co.*, 207 U. S. 463, an Act of Congress relating to liability of common carriers was considered. The act made every common carrier liable to its employees for damage resulting from negligence. This act was held to include damages resulting from intrastate or local operations, as well as from interstate transactions. The court held that the statute embraced subjects within the authority of Congress to regulate and also subjects without its constitutional power, and these were so interblended in the statute as to be incapable of separation, the court saying (p. 501):

"Of course, if it can be lawfully done, our duty is to construe the statute so as to render it constitutional. But this does not imply, if the text of an act is unambiguous, that it may be rewritten to accomplish that purpose. Equally clear is it, generally speaking, that where a statute contains provisions which are constitutional and others which are not, effect may be given to the legal provisions by separating them from the illegal. But this applies only to a case where the provisions are separable and not dependent one upon the other, and does not support the contention that that which is indivisible may be divided. Moreover, even in a case where legal provisions may be severed from those which are illegal, in order to save the rule applies only where it is plain that Congress would have enacted the legislation with the unconstitutional provisions eliminated. All these principles are so clearly settled as not to be open to controversy."

Our position does not ignore the language of Section 11 of the Act, which provides that an adjudication that any section or provision of the Act is unconstitutional or invalid for any reason shall not affect the validity of the Act as

a whole, or of any act, section, or provision not specifically adjudged unconstitutional or invalid. Such provisions are common and their effect has been considered in *Dorchy* v. *Kansas*, 264 U. S. 286. Here the constitutionality of the Kansas Court of Industrial Relations was considered. One section was held unconstitutional, and then the determination of its effect on the whole act was considered in the light of a section similar to Section 11 of this Act. The court said (p. 290):

> "Whether § 19 is so interwoven with the system held invalid that the section cannot stand alone, is a question of interpretation and of legislative intent * * *. Section 28 of the act * * * provides a rule of construction which may sometimes aid in determining that intent. But it is an aid merely; not an inexorable command".

It is said in *Lemke* v. *Farmers Grain Company*, 258 U. S. 50, when the point was raised that an unconstitutional provision caused the North Dakota Grain Act to fall (p. 60):

> "It is apparent that without these sections the state legislature would not have passed the act. Without their enforcement the plan and scope of the act fails of accomplishing its manifest purpose. *We have no authority to eliminate an essential feature of the law for the purpose of saving the constitutionality of parts of it.*" (Italics ours.)

In *Williams* v. *Standard Oil Company*, 278 U. S. 235, the Louisiana law permitting the state to fix the price of gasoline was held unconstitutional. There were provisions in the act other than those for price-fixing, and Section 12 of the act contained a clause similar to Section 11 of this Act. The court held that this raised a presumption of divisibility and said (p. 242):

> "The effect of the statutory declaration is to create in the place of the presumption just stated the opposite one of separability. That is to say, we begin, in the light of the declaration, with the presumption that the legislature intended the act to be divisible; and this pre-

sumption must be overcome by considerations which make evident the inseparability of its provisions or the clear probability that the invalid part being eliminated the legislature would not have been satisfied with what remains.

"In the present case, it requires no extended argument to overcome the presumption and to demonstrate the indivisible character of the act under consideration."

* * * * * *

And at page 245:

"Accordingly, we must hold that the object of the statute under review was to accomplish the single general purpose which we have stated, and, that purpose failing for want of constitutional power to effect it, the remaining portions of the act, serving merely to facilitate or contribute to the consummation of the purpose, must likewise fall."

III.

POINT.

The Tax Act violates Section 16 of Article III of the Constitution of Idaho which provides that every Act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title.

Authorities.

Section 16, Article III, Constitution of Idaho.
Posados v. *Warner, B. & Co.*, 279 U. S. 340.
State v. *Banks*, 37 Idaho 27.
Hailey v. *Huston*, 25 Idaho 165.
Pioneer Irrigation District v. *Bradley*, 8 Idaho 310.
Cooley's Constitutional Limitations, Eighth Edition, Vol. I, page 310.
In re Breene, 14 Colo. 401.
Utah Mortgage Loan Corp. v. *Gillis*, 49 Idaho 676.
Jackson v. *Gallet*, 39 Idaho 382.
Turner v. *Coffin*, 9 Idaho 338.
Katz v. *Herrick*, 12 Idaho 1.

Summary.

(1) The title and Act contain two subjects—

(a) the levy of a license tax on electric energy generated in the state; and (b) a subsidy in favor of irrigation pumping users, and is, therefore, void under Idaho Constitution. Article III, Section 16. *State* v. *Banks, supra; Hailey* v. *Huston, supra* (*infra*, pp. 76-79).

(2) The subject of the Act is not expressed in the title, in that,—(a) the title purports to levy a license tax on electric energy generated for barter, sale or exchange, and the

text of the Act purports to levy a tax on the producer of electric energy for barter, sale or exchange, measured by all electric energy generated, manufactured or produced by him; (b) there is a variance between that part of the title which relates to Section 5 of the Act exempting from the tax electric energy used for pumping water, and the text of Section 5 which does not provide an exemption, but a subsidy to irrigation pumping consumers. The Act is void for these variations between subject and title. *Utah Mortgage Loan Corp.* v. *Gillis, supra; Jackson* v. *Gallet, supra,* and other cases cited (*infra,* pp. 79-82).

Argument.

(1) *The title and Act contain two distinct subjects.*

Section 16 of Article III of the Constitution of Idaho provides:

> "Every act shall embrace but one subject, and matters properly connected therewith, which subject shall be expressed in the title; but if any subject shall be embraced in an act which shall not be expressed in the title, such act shall be void only as to so much thereof as shall not be embraced in the title."

The Tax Act under consideration contains two subjects, expressed both in title and text.

Quoting so much of the title as is necessary to state the point, it is

> "An act levying a license tax of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange * * * exempting from such license tax the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho and providing that such exemptions shall accrue to the benefit of the consumer of such electricity and electrical energy * * *".

All of the Act, except Section 5 thereof, which relates to the so-called exemption, and all of the title, except the clause relating to such exemption as above quoted, are germane to the levy of a license tax, and the provision of means for its enforcement.

But, as argued under the preceding point, Section 5 of the Act does not grant an exemption of certain electric energy from the tax, but provides a credit upon the power bills of consumers. Whether this provision be valid or not, both the title and the Act provide for two distinct subjects—(a) the levy of a license tax for revenue purposes, and (b) a definite reduction of existing charges for irrigation pumping by an amount equal to the tax that would otherwise be payable under the Act. If this be a valid exercise of legislative power, one part of the title and Act relates to the raising of revenue, and the other part of title and Act to the appropriation of private money, or, perhaps, to the reduction of rates for a certain class of utility service.

We recognize the rule stated by this court in *Posados* v. *Warner, B. & Co.*, 279 U. S. 340, wherein it is said (p. 344):

> "The purpose is to prevent the inclusion of incongruous and unrelated matters in the same measure and to guard against inadvertence, stealth and fraud in legislation. * * * in order to warrant the setting aside of enactments for failure to comply with the rule, the violation must be substantial and plain."

But this is a "substantial and plain" violation of the constitutional provision. In such cases the Supreme Court of Idaho has subjected legislation of that state to strict construction.

> "An examination of the title and the act discloses that the subject is embraced in both and therefore in compliance with sec. 16, art. 3, but the act is still repugnant to that section, for the reason that it embraces more than one subject and matters properly connected therewith. The negotiation and sale of general fund treasury notes and the negotiation and sale of refunding bonds are two separate and distinct subjects. The former has nothing

to do with the indebtedness of the state (*State* v. *Eagleson* 32 Ida. 276, 181 Pac. 934; *State* v. *Eagleson,* 32 Ida. 280, 181 Pac. 935), while the latter has. The former is in no sense properly connected with the latter. The acts are individualized. Each is independent of the other and neither can be, by fair intendment, considered as falling within the same subject matter legislated upon or necessary as ends and means to the attainment of each other. Neither is directly or indirectly related to the same subject" (p. 31).

State v. *Banks,* 37 Idaho 27.

"And if it were included in the title to said act, the act would be obnoxious to the constitution under another provision of Sec. 16, which declares that every act shall embrace but one subject and matters properly connected therewith. A general appropriation act includes one subject and an increase in the salary of an officer is another and distinct subject, and being two separate and distinct subjects, they are prohibited from being combined in one act by the provisions of said section.

* * * * * *

"That section of the constitution which provides that every act shall embrace but one subject and matters properly connected therewith, and that such subject shall be expressed in the title, was for the purpose of giving the members of the legislature as well as citizens generally notice of the purpose and object of the bill, and provides for titles to all bills as well as for a unity of title and subject matter. Said appropriation in the general appropriation bill would not and could not amend the statute fixing the salary of the officer referred to."

Hailey v. *Huston,* 25 Idaho 165, 168, 169.

The reasons for this constitutional provision are well known and have been frequently stated. It is intended to prevent trading or "log rolling" in legislation by tacking on to bills mainly for one purpose, provisions for other and unrelated purposes in order to secure votes for their passage. *Pioneer Irrigation District* v. *Bradley,* 8 Idaho 310. The record of the passage of the Tax Act, as previously referred to, we think supports the conclusion that Section 5 was in-

serted in the Bill in order that it might secure support which was otherwise lacking. It is within the text, as well as the reason, of the constitutional provision.

(2) *The subject of the Act is not expressed in the title.*

(a) The title of the Act, as previously quoted, purports to levy "a license tax of one-half mill per kilowatt hour on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange." Section 1 of the Act requires every corporation, etc., engaged "in the generation, manufacture or production of electricity and electrical energy in the State of Idaho, either through water power or by any other means, for barter, sale or exchange" to render a statement "of all electricity and electrical energy generated, manufactured or produced by him or it in the State of Idaho during the preceding calendar month and therewith pay a license tax of one-half mill per kilowatt hour on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production."

The question arises over the meaning of the words—"so generated, manufactured or produced". Grammatically, they seem to refer to the immediately preceding similar words "all electricity and electrical energy generated, manufactured or produced * * * in the State of Idaho".

The court below has construed them to relate to the clause first above quoted—"in the generation, manufacture or production of electricity * * * for barter, sale or exchange", as in the title. If this construction is correct, then it is only on electricity or electric energy "generated, manufactured or produced in the State of Idaho for barter, sale or exchange", as described in the title, that the tax is levied. But if, on the contrary, the tax is levied on the producer for barter, sale or exchange on "all electricity and electrical energy generated, manufactured or produced by him or it in the State of Idaho", then the Act taxes a materially larger quantity of electric energy than that described in the title,

and to that extent differs from the title so materially as to bring the Act under the condemnation of that clause of Section 16 of Article III of the Idaho Constitution, above quoted, which requires that the "subject shall be expressed in the title".

The reason for this is that electric energy is generated by a commercial producer to supply not only the requirements of his consumers, but also the necessary uses at the generating station for pumps, motors, lights, etc., and to energize the system and transmit energy to the consumer. While different systems vary, a well constructed and operated system, such as that of appellant, will consume by way of station uses and system uses, or so-called losses, up to approximately 20% of the energy generated (R. 167). The nature of these losses and their relation to the electrical processes have been herein previously discussed (see *ante*, pp. 30-31).

Unless, therefore, the text of the Act is to be limited by the title, as the court below decided, the title purports to levy a tax of .5 mill per kilowatt hour on the effective delivered energy of the commercial system—that is, that which is sold to customers, and the text of the Act, in effect, levies a tax of approximately .625 mill per kilowatt hour on such effective energy, estimating losses at twenty percent.

The court below realized this discrepancy but sustained the Act against this objection on the express ground that the text of the Act was to be read in the same way as the title (Opinion on interlocutory injunction, R. 32). We will endeavor to show under Point IV that this construction renders the Act so ambiguous as to make it unenforcible and void for uncertainty.

But this construction was forced upon the court to sustain the Act, and if it erred therein then the Act must fall under the constitutional provision above quoted. It seems too clear to require argument that a tax on energy generated "for barter, sale or exchange" is an entirely different thing than a tax on "all energy generated, manufactured

or produced" in the state. Or, expressed otherwise, that a tax of .625 mill is not indicated by a title which proposes to levy a tax of .5 mill per kilowatt hour.

The legislature may very well have declared in the title of the Act that it was its intention to levy a tax on all kilowatt hours generated in the State of Idaho, but it did not do so. It restricted the basis of the tax to those kilowatt hours generated for barter, sale or exchange.

In Cooley's Constitutional Limitations, Eighth Edition, Vol. I, page 310, the distinction which we make is stated as follows:

> "As the legislature may make the title to an act as restrictive as they please, it is obvious that they may sometimes so frame it as to preclude many matters being included in the act which might with entire propriety have been embraced in one enactment with matters indicated by the title, but which must now be excluded because the title has been made unnecessarily restrictive. The courts cannot enlarge the scope of the title; they are vested with no dispensing power; the constitution has made the title the conclusive index to the legislative intent as to what shall have operation; it is no answer to say that the title might have been made more comprehensive, if in fact the legislature have not seen fit to make it so."

It is likewise well expressed in a Colorado case, *In re Breene,* 14 Colo. 401. It is said (pp. 405-406):

> "The general assembly may, within reason, make the title of a bill as comprehensive as it chooses, * * * the legislature may, on the other hand, undoubtedly contract the scope of a title to the narrowest limits. When, however, in the exercise of this discretion, it sees fit to thus restrict the title, care must be taken not to transcend, in the body of the bill, the limit thus voluntarily fixed. * * * The matter covered by legislation is to be 'clearly,' not dubiously or obscurely indicated by the title. Its relation to the subject must not rest upon a merely possible or doubtful inference. The connection must be so obvious that ingenious reasoning aided by superior rhetoric will not be necessary to re-

veal it. Such connection should be within the comprehension of the ordinary intellect as well as the trained legal mind. * * *"

Reading the title in question in connection with the body of the Act, we may say, without fear of successful contradiction, that nothing could be more foreign to the reader's mind than that the body of the Act contemplated a tax on all electric energy generated as distinguished from that generated for barter, sale or exchange.

This provision of the Constitution has been frequently construed and enforced by the Idaho courts. Thus, a tax on corporate property, or business, cannot be sustained when the title indicates that it is on "shares of stock". *Utah Mortgage Loan Corp.* v. *Gillis,* 49 Idaho 676.

A title which is delusive or false violates the Constitution. *Jackson* v. *Gallet,* 39 Idaho 382.

See also

Turner v. *Coffin,* 9 Idaho 338;
Katz v. *Herrick,* 12 Idaho 1;
Hailey v. *Huston,* 25 Idaho 165.

(b) There is a similar variance between that part of the title which relates to Section 5 of the Act "exempting from such license tax the electricity and electrical energy actually used for pumping water for irrigation purposes on lands in the State of Idaho, and providing that such exemptions shall accrue to the benefit of the consumer of such electricity and electrical energy", and the text of Section 5, which, as hereinbefore quoted and discussed, does not provide an exemption at all, but provides a subsidy to the irrigation pumping consumers. One would naturally think, upon reading the title, that such electricity or electric energy was exempt from the tax, and that some way, as, for example, by declaring that the amount of such tax should not be included in irrigation pumping rates, the exemption was to benefit the consumer, but no one would imagine from the title that the Act proposed any such subsidy under the guise of taxation as is proposed by Section 5.

IV.

POINT.

The Tax Act is void and unenforcible for the various uncertainties and ambiguities alleged in the Bill of Complaint, so that the enforcement thereof would constitute arbitrary administrative action, without legislative guide, and thus take appellant's property without due process of law in violation of the Fourteenth Amendment to the Constitution of the United States.

Authorities.

United States Constitution, Fourteenth Amendment.
Connally v. *General Construction Company,* 269 U. S. 385.
United States v. *Capital Traction Company,* 34 App. D. C. 592.
Western Union Tel. Co. v. *Texas,* 62 Tex. 630.
Standard Oil Co. v. *State,* 178 Ala. 400.
International Harvester Company v. *Kentucky,* 234 U. S. 216.
United States v. *Shreveport Grain & Elevator Co.,* 46 Fed. (2nd) 354.

Summary.

(1) The Act is void for uncertainty and ambiguity because it cannot be determined whether a tax is levied on all kilowatt hours generated or produced, or only on such as are generated or produced for barter, sale or exchange. If the latter is the true construction, and the court below so construed the Act in order to sustain it against the objection that the title did not express the subject, then the Act affords no guide or means for the determination of what electric

energy is generated for barter, sale or exchange, and does not confer upon the Commissioner of Law Enforcement any power to prescribe a formula for such determination, but attempts, on its face, to fix a place and method of measurement, which, of necessity, excludes any possibility of determining the energy generated for barter, sale or exchange (*infra*, pp. 84-88; 89-90).

(2) A similar ambiguity and uncertainty is involved in Section 5. This section provides for the so-called exemption and credit on irrigation power bills of the full tax which would have been due on such energy. Since the only measurement of the tax is at the point of generation, and the only means of determining the irrigation pumping use is at the users' pumps, there is no possible means of determining the amount of energy generated for irrigation pumping (*infra*, pp. 88-90).

(3) The Act, being highly penal in its nature, must be capable of definite construction and enforcement according to its terms, and failing in this, violates the due process clause of the Constitution. *Connally* v. *General Construction Co.*, *supra*; *United States* v. *Capital Traction Co.*, *supra*; *International Harvester Co.* v. *Kentucky*, *supra*; *U. S.* v. *Shreveport Grain & El. Co.*, *supra*; *Western Union Tel. Co.* v. *Texas*, *supra* (*infra*, pp. 90-93).

Argument.

Two principal uncertainties and ambiguities in the Tax Act are alleged in paragraph 16 of the Bill of Complaint (R. 13, 14). They are stated in the Summary under this Point.

(1) In the argument under the preceding point, we discussed the difficulty in construction of Section 1, the basic section of the Act. By only one construction can the Act be held to be definite and certain; that is, that the tax is on all kilowatt hours generated whether for barter, sale or exchange or for the producer's own use. But this construc-

tion renders the Act vulnerable under Section 16 of Article III of the Idaho Constitution as previously discussed.

It was, therefore, contended by the State and was held by the court below on the motion for interlocutory injunction, that the tax is only on kilowatt hours generated for barter, sale or exchange.

The court in its memorandum opinion said the text of the Act "refers to energy generated for 'barter, sale or exchange' the same as referred to in the title" (R. 30), and that both title and Act "provide for a license tax of one-half mill per kilowatt hour on electricity generated, manufactured or produced for barter, sale or exchange" (R. 32). The defendant's amended answer accepts this interpretation of the Act and denies (paragraph 5) that the defendant Commissioner has construed or will "construe said Tax Act to impose a tax on all electrical energy generated or produced within the State of Idaho or upon any such energy other than that produced within said State for barter, sale or exchange" (R. 40), and further denies (paragraph 6) that "said Commissioner intends to compute or ascertain or assess against plaintiff any taxes upon any electrical energy except that produced and generated by plaintiff in the State of Idaho for barter, sale or exchange" (R. 41).

This, then, being the formal construction of the Act both by the court and the chief law officers of the State, we find that the form of license tax statement prescribed by the Commissioner for administration of the Act, provides for a statement of the total number of the kilowatt hours generated, and for deduction therefrom of those furnished for pumping water for irrigation on lands in Idaho, and the kilowatt hours "actually transformed into power or light by producer for use personal to it and not bartered, sold or exchanged, exclusive of losses in transmission". The tax due is computed on the net kilowatt hours generated after these deductions. Provision is then made for a statement of the credits on power bills of irrigation users as provided in Section 5. (For form of statement see R. 105-109).

Certainly there is nothing in the Tax Act which justifies this construction. While an erroneous construction by the Commissioner is not grounds to enjoin the enforcement, yet such construction definitely evidences the fatal ambiguities of the Act as construed by the court below and the respondent Attorney General.

If the Act only taxes electric energy generated for barter, sale or exchange, there is no justification for the assessment of a tax on kilowatt hours generated in response to system demands and uses, or so-called system losses. Energy generated to magnetize the transformers (iron losses), and to overcome the resistance in the conductors (copper losses), used in the conveyance of energy to the consumers, is no more generated for barter, sale or exchange than is energy used to light the power stations and operate station pumps and other control apparatus.

If, therefore, we assume the Commissioner is wrong in not providing for deduction of these system uses or losses as well as the station uses, the statute leaves us without means for determining what these uses or losses are. The only basis of measurement prescribed by the Act is meter readings "at the place of production", and the Act assumes that one may there definitely measure energy generated for barter, sale or exchange. But this is impossible. Energy so generated can only be determined from the readings of the consumers' meters showing the deliveries to consumers (Hale, R. 161, 162). Now we agree that the Act could validly provide, in levying a tax on energy generated for barter, sale or exchange (if we disregard the interstate commerce question), either for a report of the total energy so bartered, sold or exchanged, or for a determination of a method of calculation of system uses or losses by the Commissioner, but it has not done so.

On the appellant's system the problem is mathematically insolvable with respect to energy transmitted to Utah for barter, sale or exchange. The energy delivered to that part

of the system located in Utah there becomes commingled with energy originating in Utah (Hale, R. 169):

> "It is not possible from any meter which the company has, or which it could install at the generating stations or so-called place of production, to record or determine the actual number of such kilowatt hours generated for barter, sale or exchange."

The Act not only gives no basis for even an approximate computation of this quantity, but if it be rewritten so as to provide for such a determination by meter readings in Utah, it would seem that not only would the State be going beyond its territorial jurisdiction in obtaining the data necessary for the enforcement of its tax, but the tax by its very terms would be one upon energy bartered, sold or exchanged in Utah.

In brief, construing the Act as the court has construed it, as a tax on energy generated for barter, sale or exchange, no provision has been made, and by the terms of the Act in basing the tax solely on measurements at the place of production, administrative provision is excluded, for a determination of the amount on which the tax is to be paid.

The legislature is explicit in prescribing the method of measurement of the tax. The method prescribed by the Act is inflexible and the Commissioner of Law Enforcement is not empowered to depart therefrom. Section 1 of the Act provides that the tax shall be

> "measured at the place of production and as shown on such statement in the manner and within the time hereinafter provided."

Section 4 of the Act, among other things, provides

> "for the purpose of measuring such electricity and electrical energy such producer shall keep and maintain at the point or points of production a recording watt hour meter or meters, or other suitable instrument for measuring the electricity or electrical energy produced."

When the Commissioner attempts to construe the Act in accordance with the court's decision, his construction must necessarily be arbitrary, as it is in the form which he has prescribed, viz., arbitrarily providing for the subtraction of energy used by the appellant company for one purpose, and equally arbitrarily refusing to subtract energy used by the company for another but equally indispensable purpose. If he were to make provision for some form of computing system uses or losses his formula would be equally arbitrary, and extrinsic either to the text of the Act or any authority conferred upon him by it. Nor is this uncertainty by any means a trifling detail. It is shown by the evidence that the so-called station uses for pumps, motors, lights, etc., for the Idaho stations amount to approximately 7,000,000 kilowatt hours per year (R. 160), and that the transformer and line uses or losses will run to as high as twenty per cent. of the total generated energy (R. 167). Thus this uncertainty or ambiguity in the Act involves a tax liability of upwards of $20,000 per year on the appellant's system alone.

(2) A similar ambiguity and uncertainty is involved in Section 5. This section provides for the so-called exemption or credit on power bills of the "full amount of such license tax which would have been due from such producers of electricity or electrical energy". Since the only place of measurement and of calculation of the tax provided by the Act is at the generator, and the only point of determining the irrigation pumping use is at the user's pumps, there is no possible means of determining the amount of energy generated for irrigation pumping, including that required to transmit such energy to the user. The irrigation users are on all kinds of transmission and distribution lines. The losses are in fact individual to each case varying according to distance, size of conductors, kind of line and other variables (R. 167). Now, while the Act might prescribe a general formula for a conventional determination of these losses, it does not do so, but it assumes that a meter "at the place of production", taken into

consideration with billings to the consumers will in some way measure energy generated for irrigation uses. This it obviously cannot do.

These uncertainties and ambiguities in the Act were called to the attention of the court below on the final hearing after the decision on a motion for interlocutory injunction (R. 161, 162, 167), in which it had decided that the Act was to be construed as levying a tax on energy generated for barter, sale or exchange. The court apparently failed to appreciate the point or gravity of the objections. It again said in its opinion on final hearing that the purpose of the Act "is to require the payment of a license tax on all electricity and electrical energy generated in the State of Idaho for barter, sale or exchange". It "applies to the practical operations of those systems from which there can be determined the amount of electricity and electrical energy so generated" (R. 56-57). In response to the point here made the court said:

> "The tax provided for by the Act is not measured by the amount of electrical energy transmitted nor by the amount sold or used, but solely by production, regardless of where delivered and sold, as the Act expressly provides that in the generation of electricity and electrical energy for the purposes mentioned in it the ones who do so shall pay the tax of ½ mill per kilowatt hour on the amount of such electricity and electrical energy so produced and not the amount used. *We cannot yield our assent to the interpretation of the Act as given by counsel for the plaintiff when applied to the operations of plaintiff's system, that the amount of kilowatt hours generated can only be measured by meters at the points of use of customers in Utah.* For as has been said the plaintiff has determined that fact by its meters at its generation stations in Idaho for it has given the exact number of kilowatt hours of energy generated at such stations and pleaded specific amounts of 'sales in Idaho', 'transmission, distribution and sub-station losses pending its business in Idaho', and 'station use in Idaho for plaintiff's own purposes and not for barter, sale or exchange'. Counsel for plaintiff have confused the word 'production' of energy expressed in the Act with transmission, use and delivery, *and their contention that the*

> *energy transmitted and delivered to Utah consumers for barter, sale or exchange must be measured there and determined on data assembled from readings taken in Utah, cannot be sustained when we remember that the Act relates only to energy 'produced' in the state of Idaho,* which can be determined under the testimony, at 'places of production' and before it is transmitted to the foreign state" (R. 60) (Italics ours).

In its formal findings of fact the court says:

> "The defendants have prescribed forms and have notified the plaintiff that it must pay such tax as provided for in said Act without regard to whether or not said electrical energy is consumed within or without the State of Idaho and irrespective of transmission losses, but not including such electrical energy as is used by the plaintiff in station uses. Defendants will attempt to collect only such penalties of plaintiff as accrue under the provisions of this Act, subject to the decree of this Court, for failure to pay a tax on electricity generated for barter, sale and exchange" (R. 85).

Upon this finding the court concludes that "Said Tax Act is not void for uncertainties and ambiguities" (R. 94).

As stated under Point I of the argument, there is no contention that energy cannot be measured at the generating station as well as at any other place on the system. The contention is that energy generated for barter, sale or exchange cannot be so measured. Certainly the court cannot conceive of energy generated to supply the transformer and transmission uses or losses as generated for barter, sale or exchange. In brief, the court below has ignored the problem entirely.

(3) It is to be observed that the Tax Act is not only highly burdensome as a tax, so that it is most important that the tax to be paid should be definitely determinable from the Act itself, but the Act is highly penal in its nature. By Section 1 of the Act the burden of determining the kilowatt hours generated for barter, sale or exchange, if they are the basis of the tax, is upon the producer. By Section 7 "Any

person, officer, partner, agent or representative of any producer referred to in Section 1 of this Act, who shall make any false statement or affidavit in any certificate, report or statement herein required to be made to the Commissioner of Law Enforcement hereunder shall be deemed guilty of perjury". By Section 8 any producer who violates any provisions of the Act or fails to pay the license tax "or any part thereof" when due shall be liable for three times the unpaid or delinquent tax, and "an injunction may be issued, without requiring any bond, restraining the defendant from continuing to produce the electricity or electrical energy so long as any taxes due hereunder from said defendant remain delinquent". By Section 2 interest at the rate of ten per cent. per annum also accrues on taxes not paid on the due date. As referred to in the opening statement, there is no provision either in the Act or in the General Laws of Idaho for the recovery back of the tax paid under protest. Now certainly if one is to be thrown into jail and have his lawful business enjoined unless he complies with the terms of the statute, or submits to any construction thereof that the administrative official charged with its enforcement may make, the statute must be drafted with such certainty that the taxpayer, or his lawyer, or the court in a test case, should be able to interpret it with definiteness and certainty so that there is no question of the taxpayer's liability and obligation. This statute does not meet this fundamental requirement.

The law which we think applicable here is expressed in *Connally* v. *General Construction Company,* 269 U. S. 385, at page 391:

> "* * * a statute which either forbids or requires the doing of an act in terms so vague that men of common intelligence must necessarily guess at its meaning and differ as to its application, violates the first essential of due process of law.
>
> "The result is that the application of the law depends not upon a word of fixed meaning in itself, or one made definite by statutory or judicial definition, or by the context or other legitimate aid to its construction, but upon the probably varying impressions of juries as to whether

given area are or are not to be included within particular localities. *The constitutional guaranty of due process cannot be allowed to rest upon a support so equivocal.*" (Italics ours.)

In this case is approvingly cited, *United States* v. *Capital Traction Company,* 34 App. D. C. 592. The court said of a statute which was indefinite and made it a criminal offense for a street railway company to run an insufficient number of cars to accommodate persons desiring passage thereon (p. 598):

> "'The dividing line between what is lawful and unlawful cannot be left to conjecture. The citizen cannot be held to answer charges based upon penal statutes whose mandates are so uncertain that they will reasonably admit of different constructions. A criminal statute cannot rest upon an uncertain foundation. The crime, and the elements constituting it, must be so clearly expressed that the ordinary person can intelligently choose, in advance, what course it is lawful for him to pursue. Penal statutes prohibiting the doing of certain things, and providing a punishment for their violation, should not admit of such a double meaning that the citizen may act upon the one conception of its requirements and the courts upon another'."

In *Western Union Tel. Co.* v. *Texas,* 62 Tex. 630, it was said (pp. 635-6):

> "It is of the utmost importance, for the protection of the taxpayer, that tax laws should be certain, both as to the thing taxed and as to the amount of the tax, and the manner for its ascertainment; that the taxpayer may have an opportunity, without the expense of litigation, to pay such taxes as he may owe; and a tax law which does not accomplish this purpose ought to be held invalid, whether this results from an attempted exercise of power not possessed, through which the law becomes uncertain by both proper and improper subjects being combined and selected for taxation, or by the failure of the legislature for any other reason to furnish the rules by which taxes may be levied, assessed and collected."

In *Standard Oil Co.* v. *State,* 178 Ala. 400, it was said, in speaking of a tax statute (pp. 402-404):

> "Rather than nullify the section on the ground of uncertainty, the court will seek out and adopt any reasonable construction of which it is susceptible; but 'when the language of an act appears on its face to have a meaning, but it is impossible to give it any precise or intelligible application in the circumstances under which it was intended to operate, it is simply void.' * * * The intention of the Legislature must be ascertained from the words of the section. 'The court may not allow conjectural interpretation to usurp the place of judicial exposition. There must be a competent and efficient expression of the legislative will.' * * * The case presented is not one in which insensible words may be eliminated; for the words which it is proposed to eliminate are not insensible in themselves, but only so because of their reference to some other unexpressed intention of the lawmakers which is past finding out. They demonstrate, not only their own inefficiency, but also the incompleteness of the preceding provision of the section, without affording any clue as to what it would be in its complete state. To give the section the meaning contended for would establish for it a meaning that the Legislature clearly did not intend. Being unable to ascertain and declare the legislative will, inscrutable in essential part, and being denied the legislative function under the Constitution, the court has no recourse but to declare the section void and of no effect."

See also:

International Harvester Company v. *Kentucky,* 234 U. S. 216.

United States v. *Shreveport Grain & Elevator Co.,* 46 Fed. (2nd) 354.

We submit that the statute as construed by the court below as levying a tax on energy generated for barter, sale or exchange is void for ambiguity and uncertainty.

Conclusion

We respectfully urge that the decree of the court below should be reversed with directions to enter a decree making permanent the interlocutory injunction theretofore granted, restraining the enforcement of the Tax Act under review.

Respectfully submitted,

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APPENDIX.

CHAPTER 3
(H. B. No. 3)

AN ACT

LEVYING A LICENSE TAX OF ONE HALF MILL PER KILOWATT HOUR ON ELECTRICITY AND ELECTRICAL ENERGY GENERATED, MANUFACTURED OR PRODUCED IN THE STATE OF IDAHO FOR BARTER, SALE OR EXCHANGE; AND PROVIDING FOR THE COLLECTION AND DISTRIBUTION OF SUCH TAX; AND FOR FORMS AND PROCEDURE TO BE USED AND FOLLOWED; REQUIRING REPORTS OF THE PRODUCTION OF ELECTRICITY AND ELECTRICAL ENERGY AND THE FURNISHING OF EQUIPMENT FOR MEASURING SAME; PRESCRIBING PENALTIES FOR VIOLATION OF THIS ACT; EXEMPTING FROM SUCH LICENSE TAX THE ELECTRICITY AND ELECTRICAL ENERGY ACTUALLY USED FOR PUMPING WATER FOR IRRIGATION PURPOSES ON LANDS IN THE STATE OF IDAHO AND PROVIDING THAT SUCH EXEMPTIONS SHALL ACCRUE TO THE BENEFIT OF THE CONSUMER OF SUCH ELECTRICITY AND ELECTRICAL ENERGY; PRESCRIBING THE DUTIES OF THE STATE COMMISSIONER OF LAW ENFORCEMENT UNDER THIS ACT, REQUIRING HIM TO GIVE A BOND FOR THE FAITHFUL PERFORMANCE OF SAID DUTIES AND FIXING THE AMOUNT THEREOF, AND MAKING AN APPROPRIATION WITH WHICH TO CARRY OUT ITS PURPOSES.

Be it Enacted by the Legislature of the State of Idaho:

SECTION 1. That in addition to the licenses and taxes now provided by law, each and every individual, firm, partnership, common law trust, corporation, association or other organization, now engaged or hereafter to engage in the generation,

manufacture or production of electricity and electrical energy in the State of Idaho, either through water power or by any other means for barter, sale, or exchange, and hereinafter referred to as the "producer", shall on or before the fifteenth day of each calendar month, beginning with the 15th day of July, 1931, render a statement to the Commissioner of Law Enforcement of the State of Idaho of all electricity and electrical energy generated, manufactured or produced by him or it in the State of Idaho, during the preceding calendar month and therewith pay a license tax of one-half (½) mill per kilowatt hour on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production and as shown on such statement in the manner and within the time hereinafter provided.

SECTION 2. Said license tax shall be remitted with the statement and paid on or before the fifteenth day of each month, beginning with July 15, 1931, to the Commissioner of Law Enforcement, who shall receipt therefor and promptly turn same over to the State Treasurer, as other receipts of his office, and the State Treasurer shall place same to the credit of the General Fund. Taxes not paid on the due date shall become delinquent and shall bear interest from said due date at the rate of ten per cent per annum.

SECTION 3. On or before July 15, 1931, every producer referred to in Section 1 of this Act engaged in the production, generation or manufacture of electricity or electrical energy, shall make and file with the Commissioner of Law Enforcement of the State of Idaho, on forms prescribed, prepared and furnished by the Commissioner of Law Enforcement, a duly acknowledged and verified certificate which shall contain: (a) the name under which the producer is transacting business in the State of Idaho; (b) his or its post office address and principal place of business within the state; (c) the address and location of his or its production plants or stations in Idaho; (d) the name and address of the managing

agent; (e) the names and addresses of the several persons composing any firm or partnership constituting the producer, and, if a corporation, the corporate name under which it is authorized to transact business and the names and addresses of its officers, directors, resident general agent and attorney in fact; (f) certified copies of any papers necessary to show that such producer has complied with the laws of the State of Idaho in order to transact business in Idaho.

SECTION 4. Every such producer shall on or before the fifteenth day of each calendar month, beginning with July 15, 1931, and monthly thereafter, render to the Commissioner of Law Enforcement of the State of Idaho on forms prescribed, prepared and furnished by the Commissioner of Law Enforcement, a statement sworn to by the manager, president, secretary or treasurer of such producer, showing the number of kilowatt hours of electricity and electrical energy produced, generated or manufactured by him or it during the preceding calendar month. For the purpose of measuring such electricity and electrical energy such producer shall keep and maintain at the point or points of production, a recording watt hour meter or meters, or other suitable instrument for measuring the electricity or electrical energy produced, of a type to be approved by the Commissioner of Law Enforcement, the recordings therefrom to be kept on file at the principal place of business of such producer within the State of Idaho and same together with the books and records of such producer shall be subject to the inspection of the Commissioner of Law Enforcement, his deputies or assistants, during reasonable business hours.

SECTION 5. All electricity and electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho is exempt from the provisions of this act, except in cases where the water so pumped is sold or rented to such irrigated lands. Provided, the exemption here given shall accrue to the benefit of the consumer of such electricity or electrical energy. Provided further that the

full amount of such license tax which would have been due from such producers of electricity and electrical energy, if such exemptions had not been made, shall be credited annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity and electrical energy, furnishing such power, and such producer shall include a statement of the amount of electricity and electrical energy exempted by this section, furnished by it for the purpose of pumping water for irrigation purposes on lands in the State of Idaho, to the commissioner of Law Enforcement of the State of Idaho as a part of the statement required by Section 1 of this Act, together with a statement of the credits made on the power bills to the consumers of such electricity and electrical energy for the pumping of water for irrigation to be used on lands in the State of Idaho.

SECTION 6. Any producer of electricity or electrical energy referred to in Section 1 of this Act who shall hereafter engage in the generation, production or manufacture of electricity or electrical energy shall immediately upon purchasing or acquiring the plant, or installing equipment therefore, comply with the requirements of Section 3 of this Act.

SECTION 7. Any person, officer, partner, agent or representative of any producer referred to in Section 1 of this Act, who shall make any false statement or affidavit in any certificate, report or statement herein required to be made to the Commissioner of Law Enforcement hereunder shall be deemed guilty of perjury and upon conviction shall be punished by imprisonment in the state penitentiary not less than one nor more than fourteen years.

SECTION 8. Any producer referred to in Section 1 of this Act who shall violate any of the provisions of this Act or who shall fail to pay the license tax herein provided for, or any part thereof, when due shall be liable for three times the amount of the unpaid or delinquent tax, in a civil action instituted for that purpose in any court of competent jurisdiction,

by the Commissioner of Law Enforcement in the name of the State of Idaho, and in such suit upon application of the State, an injunction may be issued, without requiring any bond, restraining the defendant from continuing to produce electricity or electrical energy so long as any taxes due hereunder from said defendant remain delinquent.

SECTION 9. The State Treasurer shall, on or before the twentieth day of August of each year, beginning with August 20, 1931, prepare and furnish to the chairman of the State Board of Equalization a statement showing the total amount paid into the General Fund for the year ending August 15th of such year from the license tax provided by this Act, and the State Board of Equalization shall deduct such total amount so paid in determining the ad valorem tax for state purposes on real and personal property.

SECTION 10. In addition to any bond provided by law to be given by the Commissioner of Law Enforcement for the faithful performance of his duties, he shall give a fidelity bond in the penal sum of $50,000.00 to the State of Idaho, in the form and manner provided by law for similar bonds of state officers, and duly conditioned for the faithful performance of his official duties prescribed by this Act.

SECTION 11. If any section or provision of this Act be adjudged unconstitutional or invalid for any reason, such adjudication shall not affect the validity of this Act as a whole or of any section or provision thereof which is not specifically so adjudged unconstitutional or invalid.

SECTION 12. There is hereby appropriated out of any moneys in the General Fund, not otherwise appropriated, the sum of Fifteen Thousand Dollars ($15,000.00) or so much thereof as may be necessary, with which to carry out the purposes of this Act.

Approved March 17, 1931.

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CLERK

IN THE

SUPREME COURT

OF THE

UNITED STATES OF AMERICA

OCTOBER TERM, 1931

No. 722

UTAH POWER & LIGHT COMPANY,
a corporation,
Appellant,

v.

EMMITT PFOST, Commissioner of Law Enforcement of the State of Idaho, and FRED J. BABCOCK, Attorney General of the State of Idaho,
Appellees.

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SUBJECT INDEX

PAGE

STATEMENT OF THE CASE 9

POINT I, THE ACT DOES NOT BURDEN INTERSTATE COMMERCE

Summary 12

Discussion of facts 16
- Description of electrical processes 18
- Considered as energy drawn directly from source 24
- Function of transformers—to prepare generator output for transmission 28
- Losses or system uses 34
- Kilowatt hours, as articles of commerce 35
- Transmission lines are transportation phase 38
- Discussion of Findings of Statutory Court 41

Discussion of authorities:
- Generation as an act of manufacture 44
- Tax on manufacture does not burden interstate commerce 46
- Transformer operation, similar to packaging of goods for shipment 53
- Telegraph, telephone and radio cases 56
- Tax measured by production—not by commerce 57
- Generation separable as to amounts consumed within and without the state 62

POINT II, SECTION 5 OF THE ACT IS NOT UNCONSTITUTIONAL

Summary 67

Section 5 creates an exemption, not a subsidy, and therefore does not levy a tax for private purpose 68

Due Process of law and Equal Protection of the law considered 72

Severable from remainder of the Tax Act 79

SUBJECT INDEX
(Continued)

PAGE

POINT III, THE ACT EMBRACES BUT ONE SUBJECT, WHICH IS EXPRESSED IN THE TITLE

Summary 83
The Act embraces but one subject 84
The subject is expressed in the title 85

POINT IV, THE ACT IS NOT VOID FOR UNCERTAINTY

Summary 91
Argument 92

CONCLUSION 99

APPENDIX—TAX ACT 101

TABLE OF CONSTITUTIONAL PROVISIONS, STATUTES AND CASES CITED

	PAGE
CONSTITUTION OF THE UNITED STATES	
Art. 1, Sec. 8, Clause 3	12
Fourteenth Amendment	73, 76
CONSTITUTION OF IDAHO	
Article I, Section 13	72
Article III, Section 16	83
Article VII, Section 2	63, 67, 72
Article VII, Section 6	67, 72
Article VIII, Section 2	67
Chapter 106, Laws of Idaho 1921	69, 70
Chapter 3, Laws of Idaho 1931 (Extraordinary Session)	101
Compiled Statutes of Idaho, Section 8087	97
Adams v. Greene, 182 Ky. 504	93
Adams v. Standard Oil Co., 97 Miss. 879	81
Alaska Pacific Fisheries v. Alaska, 236 Fed. 70, aff. 242 U. S. 648	94
Allnutt v. Inglis, 12 East, 527	75
American Land Co. v. Zeiss, 219 U. S. 47	73
American Mfg. Co. v. St. Louis, 250 U. S. 459	44, 57, 63, 93
American Steel & Wire Co. v. Speed, 192 U. S. 500	62
Arizona Copper Co. v. Hammer, 250 U. S. 400	96
Arkadelphia Mill. Co. v. St. Louis, 249 U. S. 134	47
Atlantic Coast Line R. R. Co. v. Standard Oil Co., 275 U. S. 257	47, 55
Bates Mach. Co. v. Trenton Etc. Co., 70 N. J. Law 684	46
Beggs v. Edison Elec. Co., 96 Ala. 295	46
Berea College v. Kentucky, 211 U. S. 45	81
Bowman v. Continental Oil Co., 256 U. S. 642	64
Bradley v. Richmond, 227 U. S. 477	62
Brazee v. Michigan, 241 U. S. 340	81
Burke v. Mead, 159 Ind. 252	46
Chambers v. McCollum, 47 Idaho 74	83
Church of Holy Trinity v. United States, 143 U. S. 457	87
Cincinnati H. & D. R. Co., v. Bowling Green, 57 Ohio 336	74, 75

TABLE OF CONSTITUTIONAL PROVISIONS, ETC.
(Continued)

PAGE

Coe v. Errol, 116 U. S. 517 47
Columbia Ry. Gas & Electric Co. v. So. Carolina Tax Com., 134 S. C. 319 46
Comm. v. Keystone Elect. Etc. Co., 193 Pa. 245 46
Comm. v. Northern Elect. Etc. Co., 145 Pa. 105 46
Coosaw Mining Co v. So. Carolina, 144 U. S. 563 87
Cornell v. Coyne, 192 U. S. 418 ..... 43, 47, 53
Crescent Cotton Oil Co. v. Mississippi, 257 U. S. 129 ..... 47, 53
Curoe v. Spokane etc. R. R. Co., 32 Idaho 643 87

Dayton Goose Creek R. R. Co. v. U. S. 263 U. S. 456, 481 77
Detroit v. Rush, 82 Mich. 532 98
Diamond Glue Co. v. U. S. Glue Co., 187 U. S. 611 47
Diefendorf v. Gallet, Idaho S. Ct. (March 11, 1932) 63
Dorchy v. Kansas, 264 U. S. 286 81
Dow v. Beidelman, 125 U. S. 680 ..... 74, 76
Duke Power Co. v. Bell, 156 S. C. 299 46

Eastern Air Transport, Inc. v. S. C. Tax Comm. [No. 504, Oct. Term, 1931, U. S.] 59
East Ohio Gas Co. v. Tax. Comm., 283 U. S. 465 ..... 17, 25, 40, 47, 53, 61
Educational Films Co. v. Ward, 282 U. S. 379 63
Eureka Pipe Line Co. v. Hallaman, 257 U. S. 265 59

Fairley v. City of Duluth, 150 Minn. 374 81
Field v. Clark, 143 U. S. 649 79
Florida Cent. R. Co. v. Schutte, 103 U. S. 118 81
Foster-Fountain Pack. Co. v. Haydel, 278 U. S. 1 53

Gillesby v. Bd. of Comrs., 17 Idaho 586 79
Griffith v. Owens, 30 Idaho 647 88

Hailey v. Huston, 25 Idaho 165 ..... 84, 85
Hammer v. Dagenhart, 247 U. S. 251 48
Hans Rees' Sons v. No. Carolina, 283 U. S. 123 62
Heisler v. Thomas Colliery Co. 260 U. S. 245 ..... 18, 44, 46, 49
Helson v. Kentucky, 279 U. S. 245 59
Hetherington v. Camp Bird Min. etc. Co., 70 Colo. 531 46

TABLE OF CONSTITUTIONAL PROVISIONS, ETC.
(Continued)

PAGE

Hindman v. Ore. Short Line R. R. Co., 32 Idaho 140 67
Home Ins. Co. of N. Y. v. New York, 134 U. S. 594 59
Hope Natural Gas Co. v. Hall,
274 U. S. 284 ..... 43, 44, 47, 50, 61, 93
Hygrade Provision Co. v. Sherman, 266 U. S. 497, 502 94

Idaho Power Co. v. Thompson, 19 Fed. (2d) 547 ..... 72, 74
Indep. Sch. Dist. v. Pfost, 51 Idaho ..., 4 Pac. (2d) 893 .....
In re D. C. Abel, 10 Idaho 288 .....
In re Consol. Elect. Stor. Co., 26 Atl 983 46
In re Edwards, 45 Idaho 676 83

Johnson v. Long Furniture Co., 113 Miss. 373 81

Kehrer v. Stewart, 197 U. S. 60 62
Kessler v. Fritchman, 21 Idaho 30 84
Kidd v. Pearson, 128 U. S. 1 ..... 47, 48
Knight v. Trigg, 16 Idaho 256 79

LaCoste v. Dept. of Conservation, 263 U. S. 545 ..... 47, 53
Lamborn v. Bell, 18 Colo. 346 46
Leisy v. Hardin, 135 U. S. 100 56
Lembke v. Farmers Grain Co., 258 U. S. 50 52
Little Rock etc. Ry. Co. v. Worthen, 120 U. S. 97 81

Mahler v. Eby, 264 U. S. 32 92
Mich. Cent. R. R. Co. v. Mich. R. R. Com., 236 U. S. 615 66
Miller v. Strahl, 239 U. S. 426, 434 92
Munn v. Illinois, 94 U. S. 113 ..... 74, 75

McMillan v. Noyes, 75 N. H. 258 46
Nash v. United States, 229 U. S. 373 92

Nevada-California Power Co. v. Hamilton,
235 Fed. 317 ..... 46, 62
N. Y. ex rel Woodhaven G. L. Co. v. Pub. Serv. Com.,
269 U .S. 244, 249 78
No. Pac. R. R. Co. v. No. Dakota, 236 U. S. 585, 600 76

Ohio Tax Cases, 232 U. S. 576, 594 ..... 66, 97

TABLE OF CONSTITUTIONAL PROVISIONS, ETC.
(Continued)

PAGE

Oliver Iron Min. Co. v. Lord, 262 U. S. 172 ..... 44, 47, 48, 51, 53, 62
Omaechevarria v. Idaho, 246 U. S. 343 ..... 92, 94

Pacific Gas & Elect. Co. v. U. S., 45 Fed. (2d) 708 46
People ex rel. Brush Elec. Mfg. Co. v. Wemple, 129 N. Y. 543 46
People ex rel. Edison Elec. Lt. Co. v. Campbell, 34 N. Y. S. 711 46
People v. Knapp, 230 N. Y. 48, 129 N. E. 202, 207 80
Peoples Natural Gas Co. v. Pub. Serv. Com. of Pa., 270 U. S. 550 65
Phoenix Ry. Co. of Arizona v. Geary, 239 U. S. 277 97
Pierce Oil Co. v. Hopkins, 264 U. S. 137, 139 ..... 79, 95, 98
Pioneer Irrig. Dist. v. Bradley, 8 Idaho 310 84
Plymouth Coal Co. v. Pa., 232 U. S. 531, 546 66
Public Utilities Comm. of R. I. v. Attleboro Steam & Elect. Co., 273 U. S. 83 44
Public Utilities Comm. v. Landon, 249 U. S. 236 ..... 17, 47, 61

Rural H. S. Dist. v. School Dist., 32 Idaho 325 87

San Diego Land Co. v. Nat. City, 174 U. S. 739, 754 72
Shafer v. Farmers Grain Co., 268 U. S. 189 53
Smallwood v. Jeter, 42 Idaho 169 88
Smith v. Wilkins, 164 N. C. 135 81
Smyth v. Ames, 169 U. S. 466 76
South Carolina Cases, 52 Fed. (2d) 515 ..... 64, 98
Spreckels Sugar Refin. Co. v. McClain, 192 U. S. 397 62
Sprout v. South Bend, 277 U. S. 163 ..... 54, 6[illegible]
Standard Oil Co. v. Brodie, 153 Ark 114 95
State v. Am. Sugar Refin. Co., 108 La. 603 46
State v. Banks, 37 Idaho 27 ..... 84, 85
State v. Bird, 29 Idaho 47 98
State v. Bowman, 40 Idaho 470 87
State ex rel. Caster v. Flannelly, 96 Kan. 372 55
State v. Clausen, 65 Wash. 156 81
State v. Dolan, 13 Idaho 693 ..... 84, 88, 91

TABLE OF CONSTITUTIONAL PROVISIONS, ETC.
(Continued)

	PAGE
State v. Elba Bank & Tr. Co., 18 Ala. App. 253	81
State v. Grimmett, 33 Idaho 203	67
State v. Interst. Power Co., 118 Nebr. 756, 770-1	45
State v. Livingston etc. Mfg. Co., 34 Mont. 570	94
State v. Mulkey, 6 Idaho 617	79
State v. Omaechevarria, 27 Idaho 797	94, 97
State v. Pasta, 44 Idaho 671	88
State v. Paulsen, 21 Idaho 686	81
State ex rel. Taylor v. Mirabel, 33 N. M. 553	84, 85
State ex rel. Toomey v. State Bd., 74 Mont. 1	93
State of Wash. v. Parmenter, 50 Wash. 164	80
St. Louis S. W. Ry. Co. v. Arkansas, 235 U. S. 350	65, 81
Swift & Co. v. United States, 196 U. S. 375	17, 53
Turner v. Coffin, 9 Idaho 338	88
United Fuel Gas Co. v. Hallanan, 257 U. S. 277	59
United States v. American B. & M. Co., 31 Fed. (2d) 448	56
United States v. Brewer, 139 U. S. 278, 288	92
Utah Mtg. Loan Co. v. Gillis, 49 Idaho, 676	85
Waters-Pierce Oil Co. v. Texas, 212 U. S. 86	93
Water Works v. Schottler, 110 U. S. 347	74
Weaver v. Rambow, 37 Idaho 645	87
Weller v. New York, 268 U. S. 319	80, 81
Western Union Tel. Co. v. Atty. Gen., 125 U. S. 530	59
Western Union Tel. Co. v. Texas, 105 U. S. 460	56
West Virginia & M. Gas Co. v. Towers, 134 Md. 137	55
White v. United States, 191 U. S. 545	87
Williams v. Baldridge, 48 Idaho 618	68, 69, 83
Williams v. Standard Oil Co., 278 U. S. 235	82

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Appellees.

BRIEF OF APPELLEES

STATEMENT OF THE CASE

Appellant, by its Bill of Complaint, seeks to enjoin the enforcement of the Tax Act referred to in its brief, (said act is referred to herein as the Tax Act and is quoted in full in the Appendix) upon numerous grounds which appear in detail from its Statement of Points to be relied upon. By the decision of the Court below on the application for interlocutory injunction, (52 Fed. (2d) 226), the Tax Act was sustained against all objections urged save as to whether, as applied to

Appellant, the act imposes a burden on interstate commerce. A Master was appointed to take testimony on this question, presented here in the Statement of Evidence (R. 56, 84, 96-7). The decision on final hearing is found in 54 Fed. (2nd) 803.

Appellees contend that there are no fatal differences between the title and the act; that the tax is levied only upon electrical energy generated for barter, sale or exchange, that in practical conception generation, transmission and use are not integral and inseparable, but separate industrial operations and activities; and that generation is similar to manufacture and of local situs. The statement that Section 5 of the Tax Act was inserted to secure its passage we consider as not borne out by the record, which does not disclose why the bill failed of passage at the regular session. Said section provides an exemption from the tax of electrical energy used for pumping water for irrigation purposes in Idaho; but further provides that the exemption shall accrue to the benefit of the consumer. These matters are controverted points which will be discussed at length in argument. In the Court below the Appellant urged as an objection to the Tax Act the severity of the penalties imposed for failure to pay the tax. This objection is referred to in Appellant's Statement of the Case, but not included in its Assignment of Errors or Statement of Points to be Relied Upon, and we therefore consider it as abandoned.

The interconnected system of Appellant includes some eleven generating stations in Idaho, all hydro-

electric, employing the power of falling water in or from the streams of Idaho in lieu of the power of burning fuel in steam plants. A part of the electrical energy generated by such stations is distributed to consumers in Idaho, and the remainder transmitted to and distributed in Utah. Such stations are so interconnected by transmission lines, however, as to permit delivery to any point on the system of electrical energy generated at distant stations, since the situs of the plant, the character of machinery employed therein, and the manner of operation thereof do not determine or control the destination or use of their output. Appellant's system is also interconnected with the lines of the Idaho Power Company so as to enable either company to deliver electrical energy to the other; substantial amounts of electrical energy are generated by the other company and sold to Appellant for distribution.

The electrical energy sold by Appellant for use in pumping water for irrigation purposes in Idaho is sold under regulation of the Public Utilities Commission and established rates, intended to provide to Appellant a reasonable return upon its capital investment. The record here does not involve a rate hearing, nor does the evidence disclose whether the operation of the Tax Act would deprive Appellant of a reasonable return. The statement of Appellant that in excess of 72 per cent of its revenues from Idaho business is now demanded by the State of Idaho in taxes is without relation to the issues here presented. Appellant's revenues in Idaho accrue from the sales of electrical energy,

whereas the tax imposed is laid with respect to the activity of generating electrical energy for sale, and without regard to its subsequent transmission in intrastate or interstate commerce.

We concur in the suggestion of Appellant that there is no substantial dispute as to the facts, scientific or practical, relating to the manner of operation of appellant company, and to the generation, transmission, and distribution in sale of electrical energy. The differences that arise relate to the selection of facts to be considered material and controlling and the emphasis to be placed thereon.

POINT I.

THE TAX IS IMPOSED UPON THE ACTIVITY OF GENERATION AS AN INTRASTATE OCCUPATION, AND WITHOUT BURDEN ON INTERSTATE COMMERCE EXCEPT AS INDIRECT AND INCIDENTAL.

SUMMARY

(a) The tax is laid upon the activity of generating electrical energy for barter, sale or exchange, as an act of production, and without regard to its subsequent transmission in interstate or intrastate commerce.

(b) The process of generation, manufacture or production, which we shall hereinafter refer to as "generation," is a process of converting energy into the electrical form in order to its use in devices and appliances

which require energy in that form. Such change in form is also required in order to transmission over Appellant's system. The change is substantial in character, and is a change in the characteristics of the energy, accomplished by mechanical devices which impress their output with definite physical characteristics as to voltage, current and character as alternating or direct current, according to the design of the mechanical devices employed to accomplish generation. The process is completed before the pulses of energy leave the generator in their flow to the station bus or the transformer.

(c) The essential character of generation is such that the generator does not function to produce electrical energy for barter, sale or exchange, except as its output is called for or demanded by Appellant's consumers. This response of the generator to the demand of the consumer is not inherent in generation, but is accomplished through the use of auxiliary controlling or regulating devices adapted to that purpose. The demand of a consumer's appliance is not related to the production of any specific generator or generating station, but is impressed upon the system as a whole and Appellant supplies the aggregate demand by generation at such station or stations and in such varying quantities between stations as it may determine.

(d) The components of electrical energy are voltage and current. With the voltage and current at which the energy flows from the generator, it may not

be transmitted to distant points (in this case to Utah). The transformer is therefore interposed to change the current and voltage in order to effect transmission. This change is similar to the packaging of goods for shipment, and the output of the generator cannot be said to have entered upon its final journey until it leaves the transformer.

(e) The losses or so-called uses in the system effectually distinguish generation from use, in that the percentage of electrical energy generated by stations which is delivered to consumers, is dependent upon the character of construction of the transmission line and distribution system and their efficiency of maintenance, and not by any character of machinery or manner of operation at the generating plant.

(f) The kilowatt hour is a unit of measurement of an amount of electrical energy that will accomplish a definite amount of mechanical work. It is not a measurement of any period of service, in that it may be generated and/or sold, delivered and used in the fraction of a second or over the period of hours. It is an article of commerce and bought and sold as such.

(g) No tax is attempted to be imposed upon the kilowatt hour itself. The tax is measured by the amount of electrical energy generated without respect to its subsequent transmission, at the first practical point of measurement, and prior to its "packaging for shipment" by the transformer.

(h) The operation of Appellant's system as a whole does not destroy the distinction between the several and separate steps of generation, transmission and distribution in industrial and legal contemplation. These separate steps may be undertaken by separate entities. Transmission is subsequent to generation and similar to the transportation of goods after manufacture. The control of the routing of the electrical energy is in the transmission network and not in the hands of the man in control of the generator. Only the transmission phase is in interstate commerce.

(i) The tax imposed is an excise tax with respect to an activity for which no license is required, and imposed solely because of the act of generating for barter, sale and exchange, without regard to transmission. Where generation is accomplished by others from whom Appellant purchases electrical energy, Appellant pays no tax with respect to its transmission of such energy.

(j) The telephone and radio cases discussed by Appellant are to be distinguished in that they deal only with transportation. The transmission of thoughts, intelligence, and entertainment is not an act of production or manufacture.

(k) The mode of measurement is upheld by the rule of American Manufacturing Company v. St. Louis, infra.

(l) The tax being imposed solely because of the intrastate activity of generation and without respect to

whether the output of the generator is thereafter transmitted in interstate commerce, it is not invalidated by any intent to transport across state lines. The amount of electrical energy generated for intrastate sales is capable of determinination in the practical operation of Appellant's system and with reasonable certainty.

ARGUMENT

For the convenience of the Court, we have endeavored to relate our discussion to the Points made by Appellant. The differences between appellant and respondents as to the facts spring chiefly from the diversities of practical and purely scientific viewpoints. An undue emphasis has been placed upon the mysterious character of electricity, and the fact that it does not have, so far as we may now discern, the substance of material, although Dr. Millikan said that the fundamental unit of electrical energy was the electron, and that they attribute mass to the electron.

To the learned scientists who testified, this subtle, imponderable, physical agency, its essence yet obscure, means simply energy—capable of doing mechanical work; and the same whether considered as the energy in falling water; the chemical energy in coal or gas or oil; the mechanical energy in a moving device, or electrical energy. Doubtless the chemist sees only the presence of the same matter in things of manifest different character in common contemplation. It is a scientific truism that man cannot create anything. The natural

law of conservation of energy invoked here is no more fundamental than the natural law of "the indestructibility of matter" governing operations with ponderable substances. The ordinary mind does not confuse electrical energy with the energy in falling water, in coal or other fuels, or with mechanical energy. Dr. Millikan describes generation as the "process of transfer of the energy from the mechanical to the electrical form * * *. The energy * * * * is * changed from one form to another * * *."

To speak of such transformations as changes in its manifestations is not to alter or obscure the essential nature of the change as substantial, real, and analogous at least to the changes we see in ponderable substances; changes perceptible to our senses and intelligence only through and because of the differences in manifestations. Electrical energy is not an incorporeal conception—it is a reality, a definite physical thing. As Appellant pleads, it is capable of generation, transmission, sale and delivery in quantitative amounts, and is so generated and transmitted or purchased and transmitted, sold, and delivered by Appellant.

Commerce among the states is a practical conception (East Ohio Gas Co. v. Tax Commission, 283 U. S. 465; Public Utilities Com. v. Landon, 249 U. S. 236; Swift & Company v. United States, 196 U. S. 375, 398), and in determining what activities are interstate commerce, the distinctions made by the industry itself between generation and transmission and distribution,

when different companies conduct these operations as separate activities, are persuasive if not controlling as against purely scientific classifications.

> "Illustrations readily occur. A farmer will classify plants differently from a botanist, but the classification of both may, notwithstanding the difference, be logically proper."
> (Heisler v. Thomas Colliery Co., 260 U. S. 245)

DESCRIPTION OF ELECTRICAL PROCESSES

The process of generation is essentially a manufacturing operation, governed by the rule of Oliver Iron Mining Company v. Lord, Hope Natural Gas Company v. Hall, and other cases discussed infra. In order to gain a full understanding of the purpose, nature and effect of generation, attention should be called to certain facts and definitions in the record omitted from the discussion of Appellant.

Confirming this characterization, Dr. Millikan says:

> "The terms 'electricity and electrical energy' are commonly used to designate a particular form of energy which has been found especially adapted for efficient transferring and for general use. Energy in this form is commonly called electricity or electrical energy, to distinguish it from energy in other familiar forms, such as heat energy, chemical energy, energy of falling water and other forms of mechanical energy." (R. 110)
>
> "The great amount of the mechanical work represented by motors and our modern lighting systems, such as employed in an office building, the operation of elevators, radio systems, and doctors' X-Rays are dependent in our modern day life upon

this conversion from the mechanical, generally, into electrical form." (R. 117)

In answer to a question whether we might not state simply that by the transformation we have something with a new name, with different physical characteristics and adapted to new and different uses, he said:

> "Yes. I would prefer to change the form a little bit and say that you have mechanical energy transformed into a new form of energy which is adapted better to certain types of uses than the mechanical energy was. In some instances, uses to which we are not now able to apply mechanical energy. And in others, in order to get a greater facility or a lack of noise or odor or a more flexible control." (R. 117-8)

This character as a manufacturing operation is manifest by the fact that the output of the generator has certain characteristics with respect to current and voltage, frequency, and its character as alternating or direct current; but that no definite voltage or current or frequency, etc., is inherent in generation, or natural to electrical energy. Variable generally, they are fixed by the design and construction of the particular machinery employed to accomplish generation. As Dr. Millikan says:

> "In the generation of electrical energy it is given certain definite *characteristics* with relation to voltage and to frequency. There is no one definite frequency or voltage that is essentially inherent in generation, but they depend upon the character or characteristics of the devices employed * * *." (R. 119-20; italics ours.)

We produce, transport, and use energy in other forms. To quote from the testimony of Dr. Langmuir:

> "* * * However, we must also consider that commercially on a large scale power is transmitted in the form of chemical energy, as, for example, by transporting fuel such as coal on railroad lines to the point of consumption.
>
> "Also we have the large scale transmission of power by pipe lines which transmit natural gas or fuel oil.
>
> "In these cases the chemical energy which is locked up in the fuel is transmitted from its point of origin over the railroad lines, or through the pipe lines, to the point where the fuel is burned or consumed and its chemical energy is released and is converted to heat energy which may be either used directly or may be used to generate electric power." (R. 124-5)

Discussing the fact that each consumer converts this electric energy into some other form of energy which is suitable to his needs, such as heat, or mechanical energy, the witness says further:

> "The energy originally present in Nature is never in practical cases present as electrical energy. Man converts this energy available through Nature into electrical energy, transmits it to the consumer, and the consumer there takes the electrical energy and consumes it by converting it into some other form of useful energy. * * *
>
> "The electrical phase of this process of transferring energy from Nature to a distant point commences in the electric generator. I would regard the passage of the electrical conductors across the magnetic field produced by the field coils as the factor primarily responsible for the generation of electrical power. The whole design of the

generator is such as to permit this action to take place under controlled conditions." (R. 126)

And agrees that while energy may be transported or transmitted in other forms, as in the mechanical form by pulleys and belts or in the chemical form as coal or gas, it must be converted into electrical energy before it can be employed for the operation of the devices and appliances, such as lights, motors, etc., for which the consumer obtains electrical energy (R. 187). And with this, Mr. Peek, Mr. Hale, and Dr. Magnusson agree (R. 189-90; 162-3; 175; 207-8). Mr. Hale, the Chief Engineer of appellant company, says:

> "It must be converted into electrical energy before it can be transmitted and before it can be used for lights, motors and other devices for which we now use electrical energy.
>
> "This process of transformation is complete at the generator, and you have a greater amount of energy there, capable of doing a greater amount of mechanical work, at the generator than you do after transmitting it into Utah." (R. 169)

The consumer uses electrical energy by converting it into mechanical or heat or light energy, in the same sense the consumer uses coal, by converting it into heat energy, or gas. It is patent that the consumer does not convert electrical energy back into the energy of falling water. It is electric energy with which Appellant deals when it buys from the Idaho Power Company or when it sells and delivers to consumers, by meter measurement (Mr. Hale, R. 175). The statement of Mr. Peek that the consumer would not care in what form he re-

ceived the energy if it were just as convenient to him (R. 193), cannot be disassociated from consideration of the fact that Appellant's consumers demand and receive electrical energy as the only form of energy convenient to their purposes.

Any extended discussion of electrical energy with respect to its components and characteristics such as current and voltage will, we think, be more helpful, if postponed until consideration of the function of transformers, infra. An analogy between electrical energy and ponderable substances is somewhat difficult because we do not fully understand the character of electricity. But since it is given in generation certain definite characteristics with relation to voltage and frequency, since electrical energy manifests itself as current and voltage, and the unit of measurement is current x voltage; and since the characteristics which determine whether or not it may be employed with any certain electrical device, and which control the question of its economic transmission, are current and voltage, in practical conception, the manifestations or characteristics by which it is cognizable must be considered as the physical properties of electrical energy. The characteristics by which we distinguish different material substances, or the same substance in altered shape or form, are but like physical differences which we note with respect to their use, employment or measurement. Electrical energy must be regarded as something physical, as distinguished from that which is merely mental or moral. As with a ponderable substance, it is sus-

ceptible of change through artificial processes from one form into another, in order to new or different uses. The function of the generator is to make that available which did not exist before, that is, electrical energy as distinguished from energy in other forms.

The change in form to electrical energy is accomplished in order to the use or employment of those devices which require electrical energy for their operation. Such is the essence of a thousand different manufacturing operations. And this essential step cannot be ignored in order to accommodate Appellant's position that the sole activity engaged in by it is one of the transfer or conveyance of a natural force. Appellant also operates steam generating plants, the output of which is identical with that of a hydro-electric plant (R. 172, 212). Carried to its logical conclusion, the contention of Appellant must be that in the operation of a steam plant, and through the successive functions of furnace, boiler, turbine and generator, it is doing nothing more than establish an energy highway and to render it possible for the consumer to draw from the coal the natural energy locked up therein in chemical form. The lengths to which such an hypothesis must lead are too apparent. A practical conception of this operation was aptly summarized in Finding of Fact V of the Statutory Court, (R. 88).

CONSIDERED AS ENERGY DRAWN DIRECTLY FROM ITS SOURCE

Appellant stresses the fact that the generator produces for delivery to consumers only as called for by them; that the company maintains its facilities and machinery in order and the amount of generation is determined primarily by the demands of consumers from time to time. It is true that there is no storage on Appellant's system. The supply of electrical energy to a consuming device when the contact switch is closed does not follow from the mere operation of natural laws, but is due to the fact that the generating machinery employed is so designed and constructed that it will, almost immediately upon the demand being exerted, increase generation in the required additional amount. This is explained by Dr. Langmuir.

> "* When he closes the switch, the current and power that flow as a result through the device that he thus connects are immediately drawn from the generator. That is, any current which he draws from the line causes an immediate and simultaneous increase in the current delivered by the generator, and this in turn causes more water to flow to the generator. This action is entirely automatic. * * *" (R. 132, 139-40)

Dr. Magnusson further explains this by saying, in substance, in response to a question asking whether the generators were controlled by the consumers in their aggregate demand:

> They are controlled through a system of well conceived regulating devices. * * * The con-

sumer's load actuates the controlling devices, and they control the generator and the turbine.

The consumer initiates the load which is carried by the generator in the sense that it is due to his closing the switch that certain controlling apparatus is placed in operation.

He sets up certain impulses which go back to the generator and cause certain actions to take place there (R. 204, 207, 214).

This is substantiated by Dr. Millikan (R. 120-21; 170). This automatic adjustment of supply to demand is, as we see it, practically analogous to the supply of the natural gas at the consumer's tap. By opening the valve, the consumer takes natural gas as and when and in the quantity he desires (East Ohio Gas Company v. Tax Commission, infra). The function of the system is to keep a supply of natural gas in the pipes to be drawn upon when demanded. It is true that a ponderable substance is here involved and that the manufacture thereof has probably preceded the demand. It must be borne in mind, however, with respect to Appellant's operations, that there is no intimate relation existing between any particular consuming device and any particular generator. The demand made on the electrical system is the aggregate of many consuming devices, and the generators in operation serve to supply the system as a whole without distinguishing between the different points of use of their product.

Nor, with respect to a consumer in Utah, can it be determined that he is obtaining electrical energy generated in Utah or in Idaho, nor whether it was generated by Appellant or by the Idaho Power Company.

Appellant pleads in its Bill of Complaint:

"The demands of plaintiff's various customers in Utah and Wyoming occur on various secondary transmission and distribution lines in said States, which demands are brought partially together through local facilities and completely consolidated at Terminal station near Salt Lake City, Utah. * * *

"* * * Between Terminal and the customers' points of use, electricity or power can no longer be identified by its source, as in Idaho or Utah" (R. 9; Mr. Hale, R. 162).

"The incidence of this combined demand as between the several stations on the system, whether in Idaho or in Utah, is, within the limits of the effective capacity of the several stations, under the control of plaintiff's Dispatcher at Terminal station, under whose directions the different stations may be placed in readiness for service" (R. 9).

To quote from the testimony of Dr. Millikan:

"The man in charge of the transmission line, by opening or closing different switches, will render the output of a certain station available to consumers over that transmission network.

"Q. The mere operation of the generator or the conduct of any man at that plant cannot control the route of that energy over the transmission network?

"A. I understand that to be differentiating sharply between the man who controls the generator and the man who controls the transmission network, and my answer is that the control of the routing of the energy is in the transmission network and not in the hands of the man who is in control of the generator * * *" (R. 119).

We refer also to the statement of Dr. Langmuir:

> "It is possible, however, at any given time, at least when the peak load is not being consumed, to draw the power that is required from the net-work in varying proportions from the various generating stations. That is, if at any given time one hundred thousand kilowatts are needed from the distributing system and there are two generating stations available, they may draw fifty thousand kilowatts from each of these two stations, or they may decide to draw seventy-five thousand from one and twenty-five thousand from the other" (R. 139; Mr. Cheever, R. 148).

With respect to the points to which the output of the generator may be delivered, aside from the question of whether a demand or market exists there, a factor controlling the operations of any industry, delivery is controlled by existing facilities of transmission and distribution lines, just as the product of oil or gas wells being transported by pipe line must follow the route of established and available lines. To quote Mr. Cheever:

> "In other words, the construction of a station at a particular point does not itself determine the points into which electrical power may be taken from that station the next year or the year following" (R. 152).

This is further illustrated by the testimony of the same witness (R. 152), and of Mr. Hale, with respect to electrical energy sold to the Utah Copper Company, which takes delivery at 130,000 volts and distributes over its own system. The Appellant has no control or means of control with respect to the point on their sys-

tem at which it may be used, nor as to what devices it shall be consumed by. To quote Mr. Hale:

> "We meter the energy or power delivered to the Utah Copper Company at a point where our lines contact its line and we bill them upon the basis of that measurement.
>
> "We do not know at any time on what part of their system they are using that energy, nor is it necessary to the operations of our generating plants, or transmission lines that we do know. They may use it at the point of delivery, or some distant point on their lines, or they may use it in one device such as a motor, or in other devices such as lamps and this choice of use on their part makes no difference in the operation and conduct of our system, except, of course, as the amount of demand would vary" (R. 172).

THE FUNCTION OF THE TRANSFORMER—TO PREPARE THE GENERATOR OUTPUT FOR TRANSMISSION

The function of the transformer and the essential effect of its operation is important to this case in considering the point at which electrical energy may be considered to have entered upon its final journey across state lines (Opinion of Statutory Court, R. 59-60; Finding of Fact V, R. 89-90).

Appellant quotes the testimony of witnesses to the effect that the transformer is essentially a gearing device; that the passage of power and energy through the transformer is continuous and uninterrupted; that it changes current and voltage but does not change power or energy and is, in effect, a mere aid to accomplish a

more efficient transfer of energy. The error into which Appellant falls arises from an attempted disassociation of electric current and voltage from electrical power and energy. Mr. Peek says that "Electricity in motion constitutes electric current;" that "Power manifesting itself through the instrumentality of electric voltage and current is known as electric power;" that "Electric current is associated with electrical energy as a vehicle for said energy;" that "Electric voltage like electric current is a necessary vehicle for electrical energy;" and that "Electricity is merely a medium or vehicle for energy in electrical form" (R. 184-6). While Dr. Langmuir refers to the current that is generated, Mr. Peek says that current is not generated. We think, however, that as electrical current it must be considered as created by the generator, since the electrical phase begins definitely at some point within the generator and before the current may be said to have left the generator (R. 127).

From these confusing statements, it is necessary that we adopt some practical theory as to whether or not the function of the transformer in materially changing the electrical current and voltage operates to effect a substantial change in the characteristics of the electrical power or energy passing through the transformer. Mr. Cheever refers to current as one element of power, and we think it must be so considered in view of the fact that the witnesses are all in agreement upon the point that electrical power or energy manifests itself through the instrumentalities of current and voltage and that

the measurement thereof is current x voltage. We have likened the manifestation of electrical energy through current and voltage to the different manifestations of ponderable substances, through altered forms and shapes, to the physical senses, and considered current and voltage as the physical characteristics or physical properties of electrical energy. The substantial character of the change accomplished by the transformer is established by two things: first, without such change the electrical energy could not be transmitted from points of generation in Idaho to points of use in Utah without a loss of substantially the greater part thereof in transit. To quote Dr. Millikan:

> "* * * For illustration, electricity could be generated at 6600 volts, and economically transmitted for a distance of a few miles, and used by the consumer whose motors are operated by that voltage, without any process of voltage transformation at either end of the circuit. This would probably be done under such conditions of transmission and use; but as distances of transmission increase, transmission at such a relatively low voltage involves either excessive size of conductors or excessive losses in transmission, and the economic and practical thing to do is to step up the voltage, that is, increase the pressure, for the sake of economy in transmission. The transformers, therefore, are merely an aid to the transmission of energy in the electrical form or what we call electricity" (R. 116).

Mr. Hale, the chief engineer of the system, says:

> "We can transmit 2300 volts or 6600 volts current for some distance, but it would be impossible

to transmit that over the system we now use—that is, over the wires or the conductors—and get any appreciable part of that energy down to consumers in Utah" (R. 170).

Appellant generates a 2300 or 6600 volt current and transmits a 44,000 or 130,000 volt current (R. 163). The transformer is therefore interposed to change the current and voltage of the electrical energy so that it may be transmitted over Appellant's system. Secondly, electrical devices and appliances are designed and constructed to function with certain currents and voltages. The change affected by the transformer is such that devices which could be operated with the current and voltage in the line leading from generator to transformer would refuse to function if attached to the line upon the other side of the transformer with the different current and voltage found there and their attachment at such point would either destroy the device or disrupt the system (Mr. Hale, R. 170; Mr. Peek, R. 191-2). With an understanding of these facts, it is difficult then to comprehend the statement of Mr. Peek (R. 189) that power or energy is not changed through the intervention of the transformer, since this change in characteristics is a change in the two physical properties we recognize in and identify with electrical energy.

While the flow of electric power is continuous through the transformer, "the current, however, that comes in one end of a transformer is kept separate from the current which goes out of the other end" (Dr. Langmuir,

R. 127). The statement of Mr. Peek that the transformer is used to connect circuits of different voltage and current must not be considered to mean that the different circuits with different voltage and current could exist independent of the transformer. We have but the one source of *electrical* current, i. e., in the generator. The purpose of the transformer is to change the current and voltage which flow from the generator, a change made under controlled conditions, dependent upon the design of the transformer used. The two metallic circuits have no physical contact but are effectively insulated in the transformer and the current upon the secondary circuit is induced from that flowing in the primary winding. It may be noted that there is a similarity here between the operation of the transformer and that of the generator and, as well, a similarity between Appellant's contention that the transformer is purely a transferring device and its conception of the generator as merely a transferring device. Comparing the two differences, Mr. Hale says:

> "* * * The operation of the generator and that of the transformer is somewhat similar. You have no physical contact between the two parts in either, but you have a magnetic field of force in one, cut by the moving conductors—that is in the generator. While in the transformer, this magnetic field cuts the wires of the secondary circuit" (R. 169).

And this statement is substantiated by Dr. Magnusson (R. 201-2), and by Mr. Peek, who says in substance: that there is a similarity between the operation of the generator and the transformer; and if he were

starting the industry, he might call the generator the transformer, because its function is to transform energy, or make it available so that it can be transmitted over the transmission line, that it would not be practical to transmit any such distance as 100 miles with the 2300 or 6600 volts at which Appellant generates—for any such distance high pressure would be used—the transformer is an economical measure to reduce friction losses—transmission could be had at 2300 volts by using a larger conductor, but it would cost tremendously more (R. 191).

Since in the operation of Appellant's system the electrical energy may not be transmitted until the change has thus been made by transformer action, in any practical conception it must be considered that the electrical energy is not in final transit to consumers until after it leaves the transformer, and that the practical effect of transformer operation is to package the electrical energy for transmission or shipment. Emphasis is placed upon the fact that in the operation of the transformer there is no arrest or interruption of the movement of energy. Mere continuity of movement during manufacture, from source of raw material to loading upon the cars for shipment would not operate to change the essential character of the operation as one of manufacture, nor deprive it of local situs. A further separation of generation from use is marked by the employment of transformers in the distribution system. Except for such consumers as the Utah Copper Company, which takes delivery at high voltage and

distributes over its own system, deliveries are made at low voltages obtained through the use and operation of subsequent transformers, which induce a separate current upon a separate metallic circuit, with greatly reduced pressure (R. 164).

LOSSES, OR SYSTEM USES

In considering the intimacy between generation and use, there is found a substantial difference between the total amount generated and the aggregate of consumption by the devices employed for the utilization of electrical energy. Appellant pleads losses in transmission and distribution of approximately 20 per cent. In part this difference is consumed by the system, in part it is due to losses similar to friction losses, increasing somewhat with the length of line, (R. 151); as well as there may be losses similar to leakages, or grounds, in the useless generation of heat (R. 118-19, 121). The importance of these losses to this case is to emphasize the distinction between generation and transmission as separate processes. As Dr. Millikan says:

> "* * * The amount of energy or the percentage of the output of a plant which reaches the consumers and is put to beneficial use or employment is dependent upon the character or construction of the transmission line and of the equipment, such as transformers used in connection therewith, and upon the efficiency of maintenance and insulation and the like characteristics of the transmitting line" (R. 119).

The output of the generator, measured in practica

terms of the amount of work it will accomplish, is calculable only at the generator (R. 119; Mr. Hale: R. 169). Appellant purchases electrical energy from the Idaho Power Company which is generated by the latter company. In turn, certain municipalities served by Appellant do not generate but purchase electrical energy from appellant company and distribute and supply it to their consumers. In either instance the producer is not concerned with the efficiency of the distributor's system and does not care whether the major part of the energy it delivers is lost or wasted in transit. In this situation, it cannot be said that generation and use are integral and inseparable. We direct attention to the fact that losses may be exactly measured, a fact of particular importance when considered in relation to Appellant's Point IV. The output of a station is measured (Exhibit R. 160), the amount delivered to Terminal Station can be accurately measured, and the losses between Terminal Station and the point of delivery to customers can be determined with fair accuracy (R. 173-4). The flow of energy passing any point of the system can be definitely ascertained, and this is done as a practical and commercial operation (Dr. Magnusson; Mr. Rupp, R. 201, 211).

THE KILOWATT HOUR IS AN ARTICLE OF COMMERCE

It is thus defined by Mr. Peek:

"Electric power used through a period of time is known as electric energy. It is measured in kilo-

watt hours, and is bought and sold as an article of commerce" (R. 186).

"Similarly, a kilowatt hour may be translated into terms of mechanical energy. Horsepower hours, it might be called. After all, these are merely mechanical expressions of the ability to accomplish work. What the customer really wants is something to do work, and that is what he pays for, if I may get a little bit commercial" (R. 195).

The theory of Appellant that it is a mathematical product of the power relation between generator and receiving device and the duration of that relation, is difficult of practical conception in view of the fact that the amounts of generation exceed the aggregate of amounts used by receiving devices,—the difference being the amount of system losses—and of the further fact that the relation does not exist between generating station and any particular receiving device, but merely between transmission system and generating stations (Mr. Hale, R. 162, 166). The question that arises is whether the kilowatt hour is the unit of measurement of a quantitative amount of electrical energy or of service. It may be said that a gas company renders service when it maintains a flow of gas in its line connecting with the consumer's pipes under adequate pressure so that the consumer may obtain gas therefrom at his pleasure, and in such amounts, within the effective capacity of the system, as he desires during any given period of time. Delivery to him is not instantaneous, nor in package form, but involves the volume of flow and the factor of time. Such a definition,

however, would necessarily classify the delivery of most commodities as service rather than sale.

The testimony of all the witnesses was similar to that of Mr. Hale: "A kilowatt hour is the ordinary unit of measure of electrical energy and an amount of energy that will accomplish a certain amount of mechanical work" (R. 170). It is similar to the measurement of energy in gas by cubic feet, or gasoline by gallons, and is not merely mathematical, but commercial, practical (Dr. Mousson, R. 205). Appellant has quoted Dr. Langmuir to the effect that a consumer pays, not for the rate at which the work is done, but for the total amount of work done. The kilowatt hour is not employed to measure the duration of time since a single kilowatt hour of electrical energy may be generated or transmitted or used in the fraction of a second or over the period of several hours. The record shows that Appellant delivers to the Utah Copper Company at a load as high as 37,000 kilowatts. This would mean a delivery of more than 10 kilowatt hours per second, while a householder might not use an equivalent amount in a week. It is a commodity that the consumer uses as he desires and in such device as he elects. The Appellant is without control of the employment he may choose to make of it, and in fact without knowledge of the use to which it is being put. To quote Dr. Millikan:

> "Its use is determined by his desires as between one device and another. The generating station has no control over that choice between different uses at all. The user may want heat energy, as in an electrical cooker, or he may want mechanical

work, and the generating system has no means of differentiating or controlling such customer's uses * * *" (R. 118).

It is true that the kilowatt hour is measured only as it is transmitted and used, because of the fact that delivery is practically instantaneous with generation. We see no distinction to be made, however, because the element of time is so short between generation and delivery as distinguished between the production and delivery of other commodities. The tax attaches because of the act of generation, and the measurement adopted is of amounts generated and is the practical method of measurement of generation and not of amounts transmitted or sold or used. It may be that this measurement of generation is made while the output is also being used, but it is, however, not a measure of the amount used, nor of the duration of use.

ONLY THE TRANSMISSION LINE OF APPELLANT'S SYSTEM OPERATES IN INTERSTATE COMMERCE.

The description of Appellant's system, found on pages 35-37 of its brief, relates to facts and conclusions which assist the argument that generation is a mere integral part of a transfer, when the technical, scientific point of view is considered. The following important facts should be considered: Appellant's lines are connected as well with those of the Idaho Power Company, so that Appellant may generate and deliver electrical energy to that company when its require-

ments demand, or purchase and receive electrical energy generated by that company for distribution and sale to Appellant's consumers (Mr. Hale, R. 157-8). Appellant commonly buys substantial amounts of electrical energy generated by the other company (R. 171-2). In nowise can Appellant be considered as generating the electrical energy it purchases from the Idaho Power Company. Upon this interconnected system electrical energy is delivered from such stations as selected to bear the load. Thus, the St. Anthony or Ashton plants may be shut down, and the requirements of the communities ordinarily supplied by those stations met with electrical energy generated by the Bear River stations. The points which may be supplied from the output of a station are governed only by physical connections through transmission lines. The question of where markets will exist from time to time for the output of a station is, as with manufacturers generally, one of speculation (Mr. Hale, R. 170, 174). To what customers or markets Appellant supplies the electrical energy it purchases from the Idaho Power Company is a matter of no concern to the latter. The demand may be an aggregate of that made by many different individuals, but to the Idaho Power Company it represents merely a demand of Appellant for more electrical energy, and without relation to any individual consumer.

The fact that Appellant's system is operated as a whole does not compel consideration thereof as a single, unitary operation. An analogy is found in the pipe line cases. The oil or gas company may conduct all the op-

erations of production, transmission, and distribution, or but one or more of such operations. Yet the conduct of each operation is dependent upon the others, and, similar to Appellant's situation, the destination of the product of the well is limited by the fixed facilities of existing pipe lines. The line cannot function without well production. Similarly, well production of oil, transmission to refineries, refinement of gasoline, transportation and sale and distribution may be accomplished by a single company, yet this conduct as a single enterprise does not control the character of the successive steps as interstate or intrastate.

Mention is made of the obligation of Appellant's contract with its consumers. That the character of this engagement as one of supply or of service will be determined by the practical effect and operation thereof, rather than by a designation given by the parties, requires no discussion. However, the contract does not require generation by Appellant, but merely the delivery and distribution to consumers of electrical energy. Nor does it relate to generation at any particular place. From what source Appellant obtains the energy with which to fulfill its contractual obligations is immaterial to the consumer (East Ohio Gas Company v. Tax Commission, infra).

The local situs of generation is further emphasized by consideration of the steam generating plants, which Appellant has in Utah, and which deliver their output to the same system (R. 157). To summarize the testimony of Dr. Magnusson. whether generation is accom-

plished by the utilization of the power of falling water or the power of burning fuel, there is no distinction between the kind of energy which flows from the generator. It is exactly the same kind of energy. There are instances where it is more economical to generate by means of water power, and there are other situations where it is more economical or more desirable to generate by steam, using oil or some other fuel as the heat agent (R. 212). This is substantiated by the statements of Mr. Cheever (R. 150, 153), and by the testimony of Mr. Hale, present chief engineer, in substance, that in lieu of using its hydro-electric stations in Idaho, Appellant could generate at Utah stations constructed for that purpose and utilizing the power of burning fuel instead of the power of falling water, and that by so doing the losses in transmission from distant points in Idaho to such point would no longer exist and the expense of maintenance of transmission lines would be saved (R. 172-3). Instead, Appellant uses the power of falling water, in Idaho, to generate its electricity.

DISCUSSION OF FINDINGS OF THE STATUTORY COURT

Appellant complains as error of the finding of the Court that the kilowatt hour is a unit of measurement of energy as a physical thing and not of a period of time nor of service, and of the failure to find that the kilowatt hour is a mathematical product of the power relation between generator and receiving device and of time. (Page 51, Appellant's Brief). The evidence sus-

taining the finding adopted has been discussed (supra, page 35). The contention that the electric system is merely a vehicle for the transfer of energy, with the statement of Mr. Peek that current is merely a vehicle, that voltage is merely a vehicle and that electricity is merely a vehicle (R. 184-6) belongs too much to the realm of metaphysics when viewed in connection with the pronounced differences between electrical energy and energy in other forms, and the fact that electrical energy manifests itself through the instrumentality of current and voltage and is measured by current and voltage.

That the process of conversion to energy in the electrical form is completed at the generator is amply demonstrated by the fact that the output of the generator is in the form of electrical energy and as such is definitely and accurately measureable. (Exhibit, R. 160; Mr. Hale, supra, page 21; Dr. Millikan, R. 119; Dr. Langmuir, supra, R. 133). The process of generation is not completed at or by the receiving device, when, as Dr. Langmuir says, the receiving device takes it as electrical energy and converts it into some other form of energy.

Finding of Fact V (R. 89, 90), to the effect that the employment of the transformer is essential to change what Dr. Millikan speaks of as the characteristics, and Dr. Langmuir as the manifestations, of electrical energy, i. e., current and voltage, and that without such change Appellant cannot transmit the output of its generation stations over its system, is amply sustained

by the evidence. (Mr. Hale, supra, page 30; Dr. Magnusson, R. 202; Dr. Millikan, supra, page 30). That these changes are substantial in effect in that they permit transmission otherwise impossible over Appellant's present system, and would operate to destroy an appliance rated to the current and voltage of generation is not denied; while by all witnesses it is admitted that the measurement of electrical power is current times voltage. Electrical energy cannot be considered apart from electric current.

The use and purpose of the transformer justify the finding of the Court that the output of the generator is measured before it starts in transmission (R. 59). It is admitted that there is an absolute continuity of movement of energy—but to that point, the gas in Hope Natural Gas Company v. Hall may be flowing into the pipe line on its journey in interstate commerce before the meter measures the quantitative amounts considered in computing the tax, and with a continuity as absolute from every practical conception. The Exhibit (R. 160) shows the output of the generation stations in exact figures, and Appellant pleads the fact of losses in transmission and distribution and the delivery of lesser amounts to consumers (Bill of Complaint, par. 8, R. 4, 5).

Appellant places much emphasis upon the assertion that the tax here is not computed upon the value of amounts generated and prior to transmission but at a unit rate on the output. The difference affords no distinction (Cornell v. Coyne, supra). The incidence of

the tax is not upon the kilowatt hour, but upon the producer, as an excise levied because of the activity of generating for barter, sale or exchange. The state may adopt, for this purpose, any reasonable and fair mode of measurement or computation. Related wholly to an intrastate occupation, as it is, the subsequent transportation of the physical thing produced in interstate commerce becomes immaterial.

DISCUSSION OF AUTHORITIES

Admitting that the transmission and sale of electrical energy across state lines is interstate commerce, appellant is engaged in the process of generation as a separable industrial operation from that of transmission; and as an intrastate activity similar to the manufacture of wares or the production of a natural resource, and within the rule of Heisler v. Thomas Colliery Company, 260 U. S. 245, Oliver Iron Mining Co. v. Lord, 262 U. S. 172; Hope Natural Gas Co. v. Hall, 274 U. S. 284, and American Mfg Co. v. St. Louis, 250 U. S. 459. While, in Public Utilities Comm. of R. I. v. Attleboro Steam & Electric Co., 273 U. S. 83, the power company was engaged in generation as well as transmission, the rate charged was a single and inseparable one, based on amounts delivered, and if transmission was in Interstate Commerce, was beyond control of the state. We do not consider the decision to hold that generation was an interstate activity.

In a long line of cases it is held that generation is equivalent to or an act of manufacture of production.

Calling attention to the fact that in a great number of these cases we find the power company with its assumed technical viewpoint asserting that it is engaged in an act of manufacture, we quote from State v. Interstate Power Company, 118 Nebr. 756, 770-1, 226 N. W. 427, 432-3, as illustrative of the reason of these cases:

> "But this feature of the case is met by the defendant with the further contention that electricity or electrical energy as supplied by them, as well as their competitors at Hartington, is not a 'commodity,' nor 'a raw product,' nor 'a manufactured product,' nor is it a 'thing in general use,' nor 'any article' or 'product,' as these terms are employed in the provisions of the laws of Nebraska on which the state relies in this case that, in truth, and in fact, they are engaged in furnishing a 'service' * * *.
>
> "* * * 'Product' is defined by authoritative lexicographers as 'a thing produced by nature or the natural processes; that which is produced by an action, operation or work; a production; the results; that which results from operation of a cause, consequence, or effect.' So, too, the word 'commodity' has been defined, 'a thing of commodity; a thing of use or advantage to mankind; especially useful products; material advantages, elements of wealth;' also 'a kind of thing produced for use or sale; an article of commerce, an object of trade; especially goods, merchandise, wares, products; anything that one trades or deals in.' Indeed, a distinguished economist has defined it: 'A commodity is any portion of wealth.' Thus, in the language of everyday life and in the strictly commercial sense of the term, 'electricity' is 'produced,' 'stored,' 'measured,' 'bought and sold.' It is moved or transported from place to place in containers or by cable. It is something that one trades

or deals in. We buy it and pay for it and determine the amount of our purchases by definite and well-understood 'standard.' Brought into being as a product, it exists in modern life as a commodity. The conclusion is that, as a matter of strict definition, 'electricity' in the commercial sense of the term is not only included within the literal terms of the statutes on which the state relies, but is plainly within the reason and spirit of the enactments, and that the principles of the common law are not without application to the situation before us. * * *"

(Nevada-California Pr. Co. v. Hamilton, 235 Fed. 317, 326; Pacific Gas & Elec. Co. v. United States, (9th Circuit) 45 Fed. (2d) 708; Bates Machine Co. v. Trenton & N. B. R. Co., 70 N. J. Law 684; Beggs v. Edison Elec. Lt. & Illuminating Co., 96 Ala. 295; Lamborn v. Bell, 18 Colo. 346; Commonwealth of Pennsylvania v. Northern Elec. Lt. & Pr. Co., 145 Pa. 105; People ex rel. Brush Elec. Mft. Co. v. Wemple, 129 N. Y. 543; Hetherington v. Camp Bird Mining, etc. Co., 70 Colo. 531; McMillan v. Noyes, 75 N. H. 258; Burke v. Mead, 159 Ind. 252; In re Consolidated Elec. Storage Co., 26 Atl. 983 (1893, N. J.); People ex rel. Edison Elec. Lt. Co. v. Campbell, 34 N. Y. S. 711; State v. American Sugar Refining Co., 108 La. 603; Commonwealth ex rel. McCormick v. Keystone Elec. Lt., Ht. & Pr. Co., 193 Pa. 245; Duke Power Company v. Bell, 156 S. C. 299; Columbia Ry. Gas & Elec. Company v. South Carolina Tax Commission, 134 S. C. 319.)

The tax being imposed solely upon the activity of generation, it is therefore within the rule of Heisler v. Thomas Colliery Company and other cases cited, supra. Neither intent to transport in intrastate commerce subsequent to production or manufacture, (Crescent

Cotton Oil Co. v. Mississippi, 257 U. S. 129; Coe v. Errol, 116 U. S. 517; Cornell v. Coyne, 192 U. S. 418; La Coste v. Department of Conservation, 263 U. S. 545; Arkadelphia Milling Co. v. St. Louis, 249 U. S. 134); nor the fact that the output is to fill existing contracts (Oliver Iron Mining Co. v. Lord, supra; Diamond Glue Co. v. United States Glue Co., 187 U. S. 611), nor continuity of movement, (Public Utilities Comm. v. Landon, 249 U. S. 236; Hope Natural Gas Co. v. Hall, supra; East Ohio Gas Co. v. Tax Commission, 283 U. S. 465; Atlantic Coast Line R. R. Co. v. Standard Oil Company, 275 U. S. 257), operate to render the activity of production one of interstate commerce.

In Cornell v. Coyne, supra, the tax imposed was a unit one of 1c per pound on filled cheese. The plaintiffs in error manufactured filled cheese under contract for its export and shipped their entire product as soon as prepared. A distinction such as here contended for was made by the court between manufacture and export, and the tax and sale held not a tax or burden upon exportation. The court, speaking through Mr. Justice Brewer, cited Kidd v. Pearson, 128 U. S. 1, to the point that:

> "* * * commerce succeeds to manufacture and is not a part of it * * * The fact that an article is manufactured for export to another state does not of itself make it an article of interstate commerce, and the intent of the manufacturer does not determine the time when the article or product passes from the control of the state and belongs to commerce."

This court further remarked in Kidd v. Pearson:

> "No distinction is more popular to the common mind, or more clearly expressed in economic and political literature, than that between manufactures and commerce. Manufacture is transformation—the fashioning of raw materials into a change of form for use. The functions of commerce are different. The buying and selling and the transportation incidental thereto constitute commerce; and the regulation of commerce in the constitutional sense embraces the regulation at least of such transportation."

And, remarking that before transportation begins the labor of production is over, this court, in Hammer v. Dagenhart, 247 U. S. 251, said through Mr. Justice Day:

> " 'When the commerce begins is determined not by the character of the commodity, nor by the intention of the owner to transfer it to another state for sale, nor by his preparation of it for transportation, but by its actual delivery to a common carrier for transportation, or the actual commencement of its transfer to another state.' "

In Oliver Iron Mining Co. v. Lord, 262 U. S. 172, the state of Minnesota levied a tax upon the business of mining iron ore equal to 6 per cent of the net value of the ores mined. The court, through Mr. Justice Van Devanter, said:

> "The facts on which the contention rests are as follows: The demand or market within the state for iron ore covers only a negligible percentage of what is mined by the plaintiffs. Practically all of their output is mined to fill existing contracts with

consumers outside the state and passes at once into the channels of interstate commerce. Three-fourths of it is from open pit mines and one-fourth from underground mines. At the open pit mines empty cars are run from adjacent railroad yards into the mines and there loaded. Steam shovels sever the ore from its natural bed and lift it directly into the cars. When loaded the cars are promptly returned to the railroad yards, where they are put into trains which start the ore on its interstate journey. *The several steps follow in such succession that there is practical continuity of movement from the time the ore is severed from its natural bed.* * * * (Italics ours.)

"Plainly the facts do not support the contention. Mining is not interstate commerce, but, like manufacturing is a local business, subject to local regulation and taxation. * * *"

In Heisler v. Thomas Colliery Co., 260 U. S. 245, the tax considered was ad valorem upon anthracite coal mined, washed, screened or otherwise prepared for market. Eighty per cent of the product was shipped to other states, which constituted the major market therefor. The court, through Mr. Chief Justice Taft, said:

"We may, therefore, disregard the adventitious considerations referred to and their confusion, and, by doing so, we can estimate the contention made. It is that the products of a state that have, or are destined to have, a market in other states, are subjects of interstate commerce, though they have not moved from the place of their production or preparation.

"The reach and consequences of the contention repel its acceptance. If the possibility, or, indeed, certainty, of exportation of a product or article from a state, determines it to be in interstate com-

merce before the commencement of its movement from the state, it would seem to follow that it is in such commerce from the instant of its growth or production; and in the case of coals, as they lie in the ground. The result would be curious. It would nationalize all industries; it would nationalize and withdraw from state jurisdiction and deliver to Federal commercial control the fruits of California and the South, the wheat of the West and its meats, the cotton of the South, the shoes of Massachusetts, and the woolen industries of other states at the very inception of their production or growth; that is, the fruits unpicked, the cotton and wheat ungathered, hides and flesh of cattle yet 'on the hoof,' wool yet unshorn, and coal yet unmined, because they are, in varying percentages, destined for and surely to be exported to states other than those of their production."

In Hope Natural Gas Co. v. Hall, 274 U. S. 284, the activity taxed was that of producing natural gas and the tax measured by a percentage of the gross proceeds derived from sale. The opinion of this court says, as descriptive of the character of activity engaged in:

"The chief business of plaintiff in error is production and purchase of natural gas in West Virginia and the continuous and uninterrupted transportation of this through pipe lines into Pennsylvania and Ohio, where it is sold, delivered and consumed. The corporation owns 3,178 producing wells located in twenty-five counties of West Virginia, from which it took in the year ending June 30, 1925, more than 23 billion cubic feet of gas. And during the same period it purchased from other producers more than 25 billion cubic feet. Most of this passed into interstate commerce by *continuous* movement from the wells." (Italics ours.)

The court has thus disposed of the contentions that production is interstate in character because of continuity of movement, production to fill contractual engagements, dependency upon markets in foreign states, or the established course of business as compelling transportation across state lines. The theory of appellant that generation is inseparable and integral with transmission, distribution and use rests upon the premise that since the energy is transmitted to Utah only upon demand of the receiving device there, and since the generator cannot function to produce electrical energy except as it is demanded and used by the receiving device, the successive steps of generation, transmission and use must be considered as a single unitary operation. From the cases discussed, it is seen that continuity of movement does not compel consideration of generation as interstate, nor the fact that the output is to fill existing contracts. When the consumer opens his switch and thus connects the receiving device, the demand asserted is in effect an act constituting an order upon the company for a desired amount of electrical energy, filled by the company with regard only to the quantitative amount required, which is employed by the consumer in such device or appliance as he chooses. While this court, in the case of Oliver Iron Mining Co. v. Lord, supra, makes the following statement: "Its character in this regard is intrinsic, is not affected by the intended use or disposal of the product, is not controlled by contractual engagements, and persists even though the business be conducted in close connection

with interstate commerce," it appears that the contractual engagement entered into between appellant here and the consumer is not with reference to generation or production, but merely with respect to delivery to the consumer of the amounts of electrical energy required by him. The consumer makes his demand upon the distribution system and the system supplies such demand without reference, so far as the contract is concerned, to the source of production as in Idaho or Utah, or to production by appellant or by the Idaho Power Company.

Appellant stresses the fact that the output of the generator cannot be stored and thus made subject to subsequent disposition, and that upon a demand being made upon the system by a receiving device, the relationship between generator and device cannot be interfered with except by a complete interruption of the delivery of electrical energy. The question arises as to whether a distinction must be made between this case, where the relationship between production and market has at the time this fixed and absolute quality, and other cases where the relationship is fixed by the established course of business, although not governed by the physical necessities of the character of enterprise engaged in. In frequent instance this court has held that mere physical possibilities, such as opportunity for diversion in transit or storage, are not controlling; but that the character of the enterprise as one of interstate or intrastate commerce will be governed by the established course of business (Lembke v. Farmers Grain

Co., 258 U. S. 50, Foster-Fountain Packing Co. v. Haydel, 278 U. S. 1; Swift & Company v. United States, 196 U. S. 375; Shafer v. Farmers Grain Company, 268 U. S. 189). The established course of business of the Appellant is to transmit the major part of the output of its generators in Idaho to Utah points. The physical necessities adverted to add no additional weight. In LaCoste v. Department of Conservation; Crescent Cotton Oil Co. v. Mississippi, and in Cornell v. Coyne, supra, the entire product was shipped out of the state in regular course of business,—in Oliver Iron Mining Co. v. Lord, supra, all but a negligible percentage; and in the latter two cases under contract requiring such exportation.

We have referred to the function of the transformer as similar to the packaging of goods for shipment. In East Ohio Gas Co. v. Tax Commission, 283 U. S. 465, the appellant was engaged as a public utility in the business of furnishing natural gas to consumers in Ohio. To quote from the decision of this court, speaking through Mr. Justice Butler:

> "During the years in question it obtained approximately 25 per cent of its supply from its own Ohio wells, 72 per cent from the Hope Natural Gas Company of West Virginia, and 3 per cent from the People's Natural Gas Company of Pennsylvania. The West Virginia gas is gathered to a station in that state, there freed from gasolene vapors and pumped at a pressure of from 200 to 300 pounds per square inch into transmission lines which connect, at the boundary between the states, with appellant's high pressure transmission lines.

By means of these the gas is transmitted to a station in Stark county whence it is taken by other lines to pressure reducing stations. The lines there connect with distribution lines in which is maintained pressure of from 30 to 50 pounds per square inch and which are a part of the distribution system in each municipality served. From the latter the gas enters the local supply mains wherein pressure is reduced to that necessary, a few ounces per square inch—to carry the gas through the service pipes extending to the premises of consumers and suitably to supply their burners. *The consumers control the flow of gas on their premises.* The Pennsylvania gas is collected, treated, compressed for transmission, delivered to appellant at the state line and by it transported, relieved of pressure and conducted through such mains and service pipes to consumers' appliances precisely as is West Virginia gas. * * * * *Appellant's contracts with consumers do not specify any source from which it is to obtain gas.* To an extent not disclosed by the record, appellant collects minimum charges for service and charges for readiness to serve without regard to the quantity of gas consumed" (Italics ours).

Discussing the elementary rule that a state cannot lay a tax on an act of interstate commerce, and the rule of Sprout v. South Bend, 277 U. S. 163, "that the exaction in order to be valid must be imposed solely on account of the intrastate business without enhancement because of the interstate business done, and it must appear that one engaged exclusively in interstate business would not be subject to the imposition and that the taxpayer could discontinue the intrastate business without withdrawing also from the interstate business," the court held:

"But when the gas passes from the distribution lines into the supply mains, it necessarily is relieved of nearly all the pressure put upon it at the stations of the producing companies, its volume thereby is expanded to many times what it was while in the high pressure interstate transmission lines, and it is divided into the many thousand relatively tiny streams that enter the small service lines connecting such mains with the pipes on the consumers' premises. So segregated the gas in such service lines and pipes remains in readiness or moves forward to serve as needed. The treatment and division of the large compressed volume of gas is like the breaking of an original package, after shipment in interstate commerce, in order that its contents may be treated, prepared for sale and sold at retail. * * * * It follows that the furnishing of gas to consumers in Ohio municipalities by means of distribution plants to supply the gas suitably for the service for which it is intended is not interstate commerce but a business of purely local concern exclusively within the jurisdiction of the state."

The furnishing of gas was essentially the furnishing of energy. No change was made in the gas itself by such treatment, but the sole difference was one of pressure and division into smaller streams. To recur to the function and operation of transformers, their primary purpose is to change the voltage, in order to transmission, voltage, as appellant insists, being similar to pressure; and their operation, similar to the packaging of the energy for transmission (State ex rel. Caster v. Flannelly, 96 Kan. 372; West Virginia & M. Gas. Co. v. Towers, 134 Md. 137; Atlantic Coast

Line R. Co. v. Standard Oil Co., 275 U. S. 257; Leisy v. Hardin, 135 U. S. 100).

Appellant stresses numerous cases involving transmission by telephone, telegraph or radio, through the aid of electrical impulses. Their common quality with this case is that each involves electricity. This single similarity does not, however, render these cases authority for the rule here contended for. In the one instance electrical energy is a mere instrumentality of or aid to delivery of an extraneous thing, the message or intelligence transported; in the present case it is in itself the commodity sold and delivered. In Western Union Telegraph Co. v. Texas, 105 U. S. 460, this court said:

> "' ' * * A telegraph company occupies the same relation to commerce as a carrier of messages, that a railroad company does as a carrier of goods. Both companies are instruments of commerce and their business is commerce itself. They do their transportation in different ways, and their liabilities are in some respects different, but they are both indispensable to those engaged to any considerable extent in commercial pursuits."

The case of United States v. American B. & M. Co., 31 Fed. (2nd) 448, illustrates the same point with respect to the radio, in saying that the "result is the transmission of intelligence, ideas and entertainment. It is intercourse, and that intercourse is commerce."

In the employment of the telephone, the telegraph or the radio, no purpose to deliver to the other end of the line an amount of electrical energy to be used and em-

ployed as the receiver may desire, is sought or attempted. Electrical energy is there employed, not as the thing itself desired, but as a mere instrumentality for the conveyance of the ideas, entertainment or intelligence to be transported. The telegraph company is not a producer of the message which it transmits. Its sole activity is one of transportation and its only engagement to deliver the message filed for sending to the addressee, without alteration or change in the substance thereof. In some of the radio cases cited, emphasis has been placed upon the intimacy of sending device and receiving set and the speed of transmission. It is apparent that these facts are recited and this intimacy established because of the fact that no fixed facilities, such as wires, afford a physical connection between the two devices, and that the point sought by the court in such discussion is the actuality of transportation from sending device to receiving device.

Much emphasis has been placed upon the fact that the kilowatt hour is in course of transit, and, in fact, being used by a receiving device at the time it is being measured. We think this contention disposed of by American Manufacturing Co. v. City of St. Louis, 250 U. S. 459. The tax there in question was a municipal license tax upon the conduct of a manufacturing business in the city, measured by the amount of the sales of goods manufactured in the local factory and whether sold within or without the state. Payment of the tax was not made a condition to selling goods in intrastate, or other commerce, but only to the continued pro-

duction of goods within the City of St. Louis. It was shown that the major part of the output of the factory of plaintiff in error was sold without the state, and that this constituted its established course of business. Payment of the tax was not only measured by sales in interstate commerce, but was postponed until such sales were made. We quote from the opinion of this court delivered by Mr. Justice Pitney:

> "To the suggestion that the tax burdens the mercantile rather than the manufacturing business, because it would be possible for one to manufacture goods to an unlimited extent and pay no tax unless they were sold, or to sell goods and be required to pay the tax although they were not manufactured by the seller, it is sufficient to say—answering the second point first—(a) that, according to the state law as laid down by the court of last resort in this case, a manufacturer has no right to sell goods except those of his own manufacture; and (b) it is not to be supposed that, for the purpose of evading a tax payable only upon the sale of his goods, a manufacturer would pursue the ruinous policy of making goods and locking them up permanently in warehouses. In the outcome the tax is the same in amount as if it were measured by the sale value of the goods, but imposed upon the completion of their manufacture. The difference is that, for reasons of practical benefit to the taxpayer, the city has postponed payment until convenient means have been furnished through the marketing of the goods.
>
> "In our opinion, the operation and effect of the taxing ordinance are to impose a legitimate burden upon the business of carrying on the manufacture of goods in the city; it produces no direct burden on commerce in the goods manufactured, whether domestic or interstate, and only the same

kind of incidental and indirect effect as that which results from the payment of property taxes or any other and general contribution to the cost of government. Therefore, it does not amount to a regulation of interstate commerce. And, for like reasons, it has not the effect of imposing a tax upon the property or the business transactions of plaintiff in error outside of the state of Missouri, and hence does not deprive plaintiff in error of its property without due process of law."

Such, as we understand it, is the controlling rule here. We need only to perceive that it is the unit of production by which the tax is measured. If the liability to tax arises only from the intrastate activity and without regard to interstate operations, the state may adopt any reasonable mode of measurement which is fairly based upon or employed as a measurement of the intrastate occupation (Home Insurance Co. of New York v. People of New York, 134 U. S. 594). The record here contains no evidence to the point that the tax is disproportionate to the value of the intrastate activity. In Eureka Pipe Line Co. v. Hallanan, 257 U. S. 265, and United Fuel Gas Co. v. Hallanan, 257 U. S. 277, the act by its express terms related solely to oil or gas being transported. Helson v. Kentucky, 279 U. S. 245, may be distinguished because the tax was laid upon the use in interstate transportation (Eastern Air Transport, Inc., v. South Carolina Tax Comm. (United States Supreme Court, [March 14, 1932] No. 504, October Term, 1931).

As said in Western Union Telegraph Company v. At-

torney General of Massachusetts, 125 U. S. 530, in an opinion delivered by Mr. Justice Miller:

> "* * * we do not feel called upon to defend all the items and rules by which they arrived at the taxable value on which its ratio of percentage of taxation should be assessed; and even in this case, which comes from the circuit court and not from that of the State, we think it should appear that the Corporation is injured by some principle or rule of the law not equally applicable to other objects of taxation of like character. Since, therefore, this Statute of Massachusetts is intended to govern the taxation of all corporations therein, and doing business within its territory, whether organized under its own laws or those of some other State, and since the principle is one which we cannot pronounce to be an unfair or an unjust one, we do not feel called upon to hold the tax void, because we might have adopted a different system had we been called upon to accomplish the same result."

The rule is invoked that: the tax must be imposed solely on account of intrastate business; that one engaged exclusively in interstate commerce would not be subject to the imposition; and that the person taxed could discontinue the intrastate business without drawing from the interstate business (Sprout v. City of South Bend, supra). The tax here is imposed solely upon and on account of the intrastate business of generating as a manufacturing activity, and is not in anywise increased because of the transmission of energy across state lines. The unit of measurement is the same whether the kilowatt hour be produced for con-

sumption in Idaho or in Utah. The interstate activity of Appellant in Idaho is that of its transmission lines. *That no tax is imposed upon*, or because of, this activity is readily demonstrated by the fact that Appellant is subject to no tax because of its transmission of electrical energy generated by the Idaho Power Company. That Appellant could discontinue its intrastate business without withdrawing from its interstate business, within the meaning of the rule, is shown by such cases as East Ohio Gas Company v. Tax Commission, supra; Hope Natural Gas Company v. Hall, supra; Public Utilities Commission v. Landon, supra. In these cases it has been held that production of gas or oil at the well is taxable by the state; that transmission across state lines is interstate commerce and may not be so taxed, but that distribution within a state of natural gas is to be considered an intrastate activity. In each instance, the facilities for transmission of the product were fixed and established similarly as Appellant's transmission lines limit the transport of electrical energy to those communities reached by such lines. Similarly, the business of the parties in these cases was limited and controlled by contractual engagements. The Hope Natural Gas Company was engaged in production, purchased part of its energy in the form of gas from other producers, and transmitted across state lines in interstate commerce. It could withdraw from the intrastate business of producing only by obtaining all of the product from others, similarly as Appellant might dispose of its generating stations and purchase the entire

amount of its requirements, instead of but a part thereof as at present. The unification of separable occupations into a single system does not compel consideration of the entire operation as unitary so as to deny any separate classification (Hans Rees' Sons v. North Carolina, 283 U. S. 123, 131-2; Bradley v. Richmond, 227 U. S. 477; American Steel & Wire Company v. Speed, 192 U. S. 500; Kehrer v. Stewart, 197 U. S. 60).

That generation and transmission may be conducted by separate companies as separate industrial operations is demonstrated by the fact that Appellant transmits and sells electrical energy which it does not generate, but purchases from the Idaho Power Company; and, in turn, that it generates and transmits energy which it does not distribute to consumers, but sells to municipalities for distribution and sale. In Nevada-California Power Company v. Hamilton, 235 Fed. 317, 326, the court said:

> "The company is engaged in two lines of business: It is a manufacturer and as such its entire business is in California; there it generates all its power. It is also engaged in transmitting to, and selling electric power in, southern Nevada."

GENERATION CONSIDERED AS SEPARABLE BETWEEN AMOUNTS CONSUMED WITHIN AND WITHOUT THE STATE.

The tax involved here is not a property tax, nor attempted to be laid upon the kilowatt hour (Oliver Iron Mining Company v. Lord, supra; Spreckels Sugar Refining Company v. McClain, 192 U. S. 397; American

Manufacturing Company v. St. Louis, supra; Diefendorf v. Gallet, Idaho Supreme Court, January Term, 1932, No. 5859 (March 11, 1932). Nor is it a license tax. While so referred to in the title and act, this designation is not controlling, but its true form will be determined from its substantial operation and effect (Independent School District v. Pfost, '51 Idaho ...., 4 Pac. (2d) 893; Educational Films Company v. Ward, 282 U. S. 379).

In Independent School District v. Pfost, supra, the Idaho Supreme Court held that the legislature had plenary power with regard to taxation, and could impose excise taxes in addition to the property and license taxes specifically referred to in Article VII, Section 2 of the Idaho Constitution; and that where the activity with respect to which the tax was laid was not unlawful in the absence of special permission of the state, it would be considered an excise and not a license tax. "A mere tax imposed upon a business or occupation, therefore, is not a license, unless the levy confers a right or privilege as to the business which would not otherwise exist. * * * A license tax differs from other forms of taxation mainly in that it is imposed as a condition to entering upon the conduct of the business" (id. 896). Applying that test here, no license is required, or issued. The tax is payable, not as a condition to entering upon the conduct of generation, but subsequent to generation and with respect to amounts produced during the preceding month. If the tax be not paid when due certain tax penalties are provided for, but continued

generation is still a lawful act, not punishable in any way. The provision for the issuance of an injunction, if it can be given effect, is a mere attempted aid to collection. (Compare Bowman v. Continental Oil Company, 256 U. S. 642, 647-8, where the tax was required to be paid in advance, and any engagement in the activity without a license first procured was a misdemeanor and punishable by fine or imprisonment.) Nor, as a license tax, could it relate to anything other than the intrastate activity of generating.

That the activity of generation is one of intrastate character appears from the physical facts relating to Appellant's operations. But if it can be held and considered that generation of electrical energy destined for transmission to Utah is interstate in character, the generation of electrical energy sold and consumed in Idaho remains an intrastate occupation. The act makes no express provision for segregation, but it clearly appears that amounts generated, transmitted, or delivered to any point are capable, in practical and commercial operations, of definite ascertainment (supra, page 35). The contention of Appellant that system losses are difficult of computation with respect to delivery to individual consumers is met by the reasoning of the decision in the South Carolina cases (52 Fed (2d) 515, 522):

> "* * * The current generated in South Carolina by the South Carolina Power Company and the current sold by it in that state are measured by its electric meters with absolute accuracy; and the

method adopted in computing the tax on current brought in and sold is to add the total kilowatt hours coming into South Carolina (37,450,000) to the number generated in South Carolina (40,000,000); and from this total (77,450,000) compute the line loss (14,760,339 or 19 per cent.). This percentage of loss is applied on the current coming into the state which gives the line loss on this current (7,115,500). This is subtracted from the current brought into the state; and the result (30,354,500) represents the amount of current brought into the state and sold. It is objected that there is no average of transmission loss; but the method adopted would seem to be reasonably fair and accurate, as much so, at least, as most methods in use for computing taxes on the profits of business, which are universally upheld. *If absolute accuracy in matters of this sort were necessary to the validity of taxes, most modern taxing systems would be found invalid.*" (italics ours)

This rule is sustained by Peoples Natural Gas Company v. Public Utilities Commission of Pennsylvania, 270 U. S. 550, where this court said that after the commingling of gas from the two sources:

"* * * the two are indistinguishable. But the proportions of both in the mixture are known and that of either readily may be withdrawn without affecting the transportation or sale of the rest. So, for all practical purposes the two are separable and neither affects the character of the business as to the other. Eureka Pipe Line Co. v. Hallanan, 257 U. S. 265, 66 L. ed. 227 * * *."

In St. Louis S. W. R. Company v. Arkansas ex rel. Norwood, 235 U. S. 350, a similar question of separability being considered, this court said:

"But the state court has not as yet construed the section as calling for the forfeiture of the privilege of doing interstate business in the event of nonpayment of the franchise tax; nor is the state here insisting upon such a construction. The present is an ordinary action to collect the tax as a debt, and not to forfeit the franchise for its nonpayment. Non constat but that the state court will hold, when confronted with the question, that the franchise to be forfeited pursuant to sec. 20 is confined to intrastate commerce. Such a construction is clearly foreshadowed by what the court has in this case held with respect to the general purpose of the act. And in exercising the jurisdiction conferred by sec. 237, Judicial Code (36 Stat. at L. 1156, chap. 231, Comp. Stat. 1913, sec. 1214), it is proper for this court to wait until the state court has adopted a construction of the statute under attack, rather than to assume in advance that such a construction will be adopted as to render the law repugnant to the Federal Constitution. * * *"

(Michigan Central R. R. Company v. Michigan Railroad Commission, 236 U. S. 615, 635; Ohio Tax Cases, 232 U. S. 576, 591; Plymouth Coal Company v. Pennsylvania, 232 U. S. 531, 546.)

Nor may we overlook the well established rule to which the court then proceeds:

"* * * No canon of construction is better established or more universally observed than this: that if a statute will bear two constructions, one within and the other beyond the constitutional power of the lawmaking body, the courts should adopt that which is consistent with the Constitution, because it is to be presumed that the legislature intended to act within the scope of its authority. * * *"

(Hindman v. Oregon Short Line R. R. Company, 32 Idaho 140; State v. Grimmett, 33 Idaho 203).

The statement of Appellant that it cannot be considered that the legislature clearly intended to tax the 84 per cent of the electricity (generated by Appellant) used in Utah, "yet it also intended and devised some method to tax the relatively small amount used in Idaho if the tax on Utah use should fail" assumes without color of warrant from the record therefor that the greater part of the total amount of electrical energy generated in Idaho is transmitted to without the state. Such is not the case.

POINT II.

SECTION 5 OF THE TAX CREATES AN EXEMPTION AND NOT A SUBSIDY. AS SUCH IT DOES NOT DENY APPELLANT EQUAL PROTECTION OF THE LAWS NOR DEPRIVE IT OF PROPERTY WITHOUT DUE PROCESS; NOR DOES IT LEVY A TAX FOR OTHER THAN A PUBLIC PURPOSE IN VIOLATION OF SECTION 2 OF ARTICLE VII OR SECTION 2 OF ARTICLE VIII OF THE CONSTITUTION OF IDAHO; NOR LEVY A TAX FOR THE BENEFIT OF IRRIGATION DISTRICTS IN VIOLATION OF SECTION 6 OF ARTICLE VII OF THE CONSTITUTION OF IDAHO.

Summary.

(a) With respect to the Constitution of Idaho the

language of Section 5 is held to create an exemption and not a subsidy. It does not lend the aid or credit of the state (Williams v. Baldridge, infra).

(b) As a public utility Appellant is entitled to only a just and reasonable return. Its rate structure is not involved in this suit, and the effect of Section 5 with respect thereto is beyond the purview of this inquiry and without the evidence. Unless it imposes a rate that is non-compensatory the Tax Act is not wanting in due process because of Section 5.

(c) The exemption made by Section 5 is a permissible classification. It affects alike all who are similarly situate, and therefore does not deny equal protection. Appellant is not the proper party to claim a discrimination against irrigation uses in Utah.

(d) If the section were unconstitutional it is severable from the remainder of the act. If we delete the exemption, the remainder of the act is workable.

Argument.

Section 5 of the Tax Act is assailed upon the ground that it is wanting in due process and denies equal protection in that it compels the payment of money by Appellant for the benefit of private individuals; and that it levies a tax for the benefit of individuals and irrigation districts in violation of the Constitution of Idaho. We are thus required to examine this section with a view of ascertaining whether its effect and operation is to provide for the payment of a subsidy by Appellant to private persons or whether it serves only to create

an exemption from the tax burden otherwise indirectly imposed.

The question thus propounded is resolved by the state court in the case of Williams v. Baldridge, 48 Idaho 618. The pertinent parts of the statutes there in question read as follows:

"Section 3099. The following property is exempt from taxation: * * *

"15. Property used for generating and delivering electrical power to the extent that such property is used for furnishing power for pumping water for irrigation purposes on lands in the State of Idaho. This exemption shall accrue to the benefit of the consumer of such power except in cases where the water so pumped is sold or rented to irrigate lands, in which event the property used for generating and delivering power shall be assessed for taxation to the extent that such water is so sold or rented.

"Section 3099A. The state Board of Equalization shall, at the time of assessment of the property of any electrical public utility, determine the amount of the exemption under subdivision 15 of Section 3099 and shall reduce such assessment so that any such electrical public utility shall not be required to pay any taxes upon that portion of its property so exempted.

"The amount of such exemption or reduction by the State Board of Equalization shall be as nearly as practicable, such as would yield the amount of taxes included in the rates of the utility under the schedules applicable to the furnishing of such power.

"The full amount of taxes which would have been due from such utility if such exemption had not been made, shall be credited annually for the year in which the exemption is made on the power

bill to the consumer by the utility furnishing such power in such sum as the amount of power each consumer uses bears to the whole amount of power furnished by the utility for irrigation purposes * * *."

Suit was instituted by taxpayers to enjoin the members of the State Board from allowing to the Idaho Power Company any exemption from taxation under the provisions of such statutes (Compiled Statutes of Idaho, Section 3099, as amended, and Section 3099-A, as enacted, by Session Laws of Idaho, 1921, Chapter 106) on the ground that said statutes violated the Constitution of Idaho in that they extended and loaned the aid and credit of the state to private individuals in the nature of a subsidy. It was held that the effect of such a statutory provision was to create an exemption and not to loan the aid or credit of the state to private individuals, nor to create a subsidy. In response to the contention here advanced by appellant that the situation is the same as though the tax had been collected and returned the court remarked that the same argument could be made against every tax exemption allowed, but that the Constitution explicitly directing and contemplating that the legislature might grant exemptions should not be construed to prevent what it allows.

Adverting to the rule which obtains in this state that the power of the legislature to allow exemptions from taxation is plenary, it was considered by the court that the classification made was permissible in that the necessity of irrigation to the people and the welfare of

the state compelled recognition of the expense attendant upon pumping water for irrigation, and the propriety of action seeking to make available for settlement lands otherwise unfit for cultivation, and remarked that it was not unreasonable for the legislature to attempt to equalize the burden of applying water to irrigation projects as between gravity and pumping conveyors. The opinion says in part:

> "It was the intention that the benefit of such exemption should accrue immediately to the consumer of power. This was to be accomplished by a credit on the account of each user of any electrical energy produced, the amount of such credit to be determined annually by the Public Utilities Commission. This provision does not alter the status as an exemption statute. Always the effect and often the purpose of exemption statutes is to grant a subsidy. Nor is it always true that the incidence of the subsidy is immediate. The savings effected by the exemption are often passed on to others. A tax exemption to an educational institution inures to the benefit of the students in lessened tuition charges. Therefore the mere fact that the statute outlines a method for carrying into effect that which under ordinary conditions would have taken place anyway—that is, the transfer of the ultimate benefit of the exemption to the consumer—does not change its character as an exemption statute or require us to hold that it grants a subsidy to private individuals in a manner forbidden by the Constitution.
>
> "The fact that the exemption benefits irrigation rather than the power company, instead of making the act unconstitutional, is probably the only reason which justifies the exemption. * * *".

The substantial identity of language of the two statutes leads inevitably to the conclusion that Section 5 of the act here considered was adopted from the 1921 Act and in the light of such construction thereof. Thus viewed, the legislature was plainly intending the language employed to provide only for a valid exemption and the construction of such language by the state court effectually disposes of the objection made that it offends Articles VII and VIII of the Constitution of Idaho. We are then relegated to a consideration of whether this provision deprives Appellant of property without due process of law, or compels the appropriation of money by Appellant for the benefit of private individuals or irrigation districts—a point reserved from decision in the state case above considered because the proper parties were not before the court.

The purpose of the section being to protect irrigation users from higher rates because of the tax, to be held as violative of these latter constitutional provisions it must be considered that the effect of the exemption is to alter or change a rate or charge fixed by Appellant, and that the state is wanting in power so to do; or that it compels a non-compensatory rate which, in connection with other rates charged, will not yield to Appellant a just return upon its investment and therefore denies due process within the meaning of the rule set forth in San Diego Land Co. v. National City, 174 U. S. 739, 754 (Idaho Power Company v. Thompson, 19 Fed. (2d) 547). The inhibition of Section 13 of Article I of the Constitution of Idaho is of no greater force than

the Fourteenth Amendment of the Constitution of the United States, which does not operate to deprive the states of their lawful power and of the right to resort to reasonable methods inherently belonging to the power exerted, but the provisions of the due process clause only restrain those arbitrary and unreasonable exertions of power which are not really within lawful state power since they are so unreasonable and unjust as to impair or destroy fundamental rights (American Land Co. v. Zeiss, 219 U. S. 47).

We are not involved here in a rate hearing, and the present suit is not to be confused with a determination of whether, under the provisions of the Tax Act, Appellant will be allowed a fair and reasonable return upon its capital investment; nor does the record disclose or Appellant attempt any showing as to its operation in this regard. The sole interest of the exemption is to prevent the imposition of a higher rate for pumping because of this tax, the provision for credits upon the power bills of consumers is to effectuate that purpose and insure its operation, and in practical operation its effect does not extend beyond such purpose. It is not urged that this protection of pumping rates is discriminatory, nor that it provides a rate that is confiscatory, nor was evidence offered in support of either premise.

The position of the Appellant in this regard is tenable only if it be assumed that the producer is entitled to charge and receive such rates for electrical energy furnished for pumping water for irrigation purposes in Idaho, as presently in effect, or such as it may de-

sire to establish. The generation and sale of electrical energy in Idaho by appellant company is in the capacity of a public utility (R. 1). Considering, then, whether the effect of Section 5 is to accomplish a purpose with regard to which the state is without warrant or authority, or to impose a regulation incommensurate with the law of the land, we are required to determine if the right of Appellant as a public utility to a return upon its investment is extended to such sum as it may be able, in the absence of all regulation, to procure from its operations. The exemption assailed relates only to intrastate business and has regard only to electrical energy furnished for pumping water for irrigation purposes in Idaho by Appellant as a public utility. The subject is one of proper regulation by the state, subject only to the limitations imposed by the constitutional provision that a confiscatory rate must not be required. Pursuant to such authority the state has provided by statute for the establishment of such rates by Appellant as will yield a reasonable return (Idaho Power Company v. Thompson, supra).

In the absence of such regulatory statutes, however, the rule must be the same, in that Appellant's rates would be: (a) subject to the same limitations under the common law rule, (Munn v. Illinois, 94 U. S. 113; Dow v. Beidelman, 125 U. S. 680; Water Works v. Schottler, 110 U. S. 347; Cincinnati H. & D. R. Company v. Village of Bowling Green, 57 Ohio St. 336), or (b) without restriction, so that the utility is enabled to establish its own rates. The use by Appellant of its property in

Idaho is such as to vest an interest therein in the public. The statutory provision for supervision does not constitute the establishment of a new regulation, but provides merely for the administration of one already existing. Both reason and authority deny to a corporation clothed with such rights and powers and bearing such relation to the public the power to arbitrarily fix the rates at which it will furnish electrical energy to those who desire to use it (Cincinnati H. & D. R. Company v. Village of Bowling Green, supra).

The rule has long been incorporated in our common law. In Munn v. People of Illinois, supra, this Court quoted in part the decision in Allnutt v. Inglis, 12 East, 527, decided in 1810, in which the Court quoting Lord Ellenborough said:

> " 'There is no doubt that the general principle is favored, both in law and justice, that every man may fix what price he pleases upon his own property, or the use of it; but if for a particular purpose the public have a right to resort to his premises and make use of them, and he have a monopoly in them for that purpose, if he will take the benefit of that monopoly, he must, as an equivalent, perform the duty attached to it on reasonable terms. The question then is, whether, circumstanced as this company is, by the combination of the Warehousing Act with the Act by which they were originally constituted, and with the actually existing state of things in the Port of London, whereby they alone have the warehousing of these wines, they be not, according to the doctrine of Lord Hale, obliged to limit themselves to a reasonable compensation for such warehousing. And, according to him, whenever the accident of time casts

upon a party the benefit of having a legal monopoly of landing goods in a public port, as where he is the owner of the only wharf authorized to receive goods which happens to be built in a port newly erected, he is confined to take reasonable compensation only for the use of the wharf.' "

In Dow v. Beidelman, this Court said:

"In Munn v. Illinois, 94 U. S. 113 (24:77), decided at October Term,1876, after affirming the doctrine that by the common law carriers or other persons exercising a public employment could not charge more than a reasonable compensation for their services, and that it is within the power of the Legislature 'to declare what shall be a reasonable compensation for such services, or, perhaps more properly speaking, to fix a maximum beyond which any charge made would be unreasonable,' the Chief Justice said; 'To limit the rate of charges for services rendered in a public employment, or for the use of property in which the public has an interest, is only changing a regulation which existed before. It establishes no new principle in the law, but only gives a new effect to an old one.' "

The public has a right to be exempt from unreasonable exactions, and the interest of the corporation is not the sole test of suitable rates (Smyth v. Ames, 169 U. S. 466). And the reasonableness of local rates must be determined without reference to interstate business (Id., Northern Pacific Railway Company v. North Dakota, 236 U. S. 585, 600). The scope of the Fourteenth Amendment to the Constitution of the United States and the meaning of due process do not extend to a prohibition against a statute that may operate, directly or

indirectly, to diminish the returns that Appellant would otherwise receive, but merely to lay a restraining hand upon the imposition or establishment of such rates as would deny to Appellant an unreasonable return. In Dayton-Goose Creek Railway Company v. United States, 263 U. S. 456, 481, this Court said:

> "Second. The carrier owning and operating a railroad, however strong financially, however economical in its facilities, or favorably situated as to traffic, is not entitled, as of constitutional right, to more than a fair net operating income upon the value of its properties which are being devoted to transportation. By investment in a business dedicated to the public service the owner must recognize that, as compared with investment in private business, he cannot expect either high or speculative dividends, but that his obligation limits him to only fair or reasonable profit."

If the legislature sees fit to adopt regulatory statutes, it withdraws the matter from private controversy, but if the legislature has taken no such action the situation remains unchanged in that the public utility is still limited in its charges to such as are just and reasonable. With this premise, we have no difficulty in observing that in the absence of a showing that the return permitted to it under the statute assailed will not be fair and reasonable as compensation for the use of its property, the Appellant can claim no pecuniary injury nor show that it is thus deprived of earnings or profits to which it would be otherwise entitled; nor does it appear that the Appellant is or will be unable to fully protect its property rights and interests by such adjust-

ment of its rates, if any should be required, as will afford to it a just and reasonable profit. In New York ex rel. Woodhaven G. L. Company v. Public Service Commission, 269 U. S. 244, 249, it was said, in an opinion delivered by Mr. Justice Butler:

> "This case is to be distinguished from a suit to restrain the enforcement of legislation prescribing a confiscatory rate. Here, the rate is not involved. The order directs the extension; it does not deal with compensation. The commission reasonably might assume that the company will take appropriate steps to save its property from confiscation * * * . There is nothing to show that just compensation for the service ordered may not be had, or that compliance with the order will necessarily so reduce the company's income from its operations as a whole as to be in effect a confiscation of its property * * *."

On page 69 of Appellant's Brief, the suggestion is offered that this exemption feature, if it would be otherwise valid, results in a denial of due process and equal protection in that a similar exemption is not extended where the electrical energy is used for irrigation purposes in Utah. So far as this concerns a discrimination to users offensive to due process or equal protection Appellant is not a proper party to raise the suestion. The exemption is not made for the benefit of Appellant and no pecuniary injury flows to it from such circumstance. With respect to the commerce clause, this point is not comprehended by the pleadings, wherein no discrimination is alleged as to interstate commerce by the provisions of section 5, nor any pumping use in Utah, and

was not urged in the court below (Pierce Oil Company v. Hopkins, 264 U. S. 137) and is not responsive to any assignment of error.

SECTION 5 IS SEVERABLE FROM THE REMAINDER OF THE ACT

If it were conceded that the exemption provision of Section 5 is invalid, no basis arises for the claim that the entire act must therefore fail. The Supreme Court of Idaho held in Gillesby v. Board of County Commissioners, 17 Idaho 586.

> " 'The Court is not warranted in declaring the whole statute void, unless all the provisions are connected in subject matter, depend on each other, were designed to operate for the same purpose, or are otherwise so dependent in meaning that it cannot be presumed that the legislature would have passed one without the other. The constitutional and unconstitutional provisions may even be expressed in the same section, or even in the same sentence, and yet be perfectly distinct and separable, so that the first may stand though the last fall.' "
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> Knight v. Trigg, 16 Idaho 256.
> State v. Mulkey, 6 Idaho 617.
> In re D. C. Abel, 10 Idaho 228.

This rule is universal in its application and has been repeatedly enunciated by this court.

In Field v. Clark, 143 U. S. 649, after holding a provision in a federal tariff bill unconstitutional, but refusing to accept the contention that the whole act was thereby invalidated, Mr. Justice Harlan said:

"Unless it be impossible to avoid it, a general revenue statute should never be declared inoperative in all its parts because a particular part relating to a distinct subject may be invalid. A different rule might be disastrous to the financial operations of the government, and produce the utmost confusion in the business of the entire country."

Particular force is given to this doctrine in the consideration of revenue measures. The rule is eloquently expressed by the Court in People v. Knapp, 230 N. Y. 48; 129 N. E. 202, 207:

"Thus viewing it, I cannot doubt that the exclusion of interest on intangibles will leave the essence of the scheme intact. I find it unbelievable that a legislature willing to impose a tax with those items in, would be unwilling that the tax should stand if those items were out. Undoubtedly it wished them in, if it had the legal right to keep them. To say that does not mean that, rather than lose them, it would throw the project to the winds. Laws are not to be sacrificed by courts on the assumption that legislation is the play of whim and fancy. A doctrinaire emphasis on the possible rather than the probable would forbid severance at all times. No doubt it is easy, sheltering ourselves behind some implacable tenet of the separation of governmental powers, to insist upon a certainty impossible of attainment. We do small service to the state by so intransigent a pose. Our right to destroy is bounded by the limits of necessity. Our duty is to save, unless in saving we pervert. * * * I will not readily impute a desire to place the revenues of the state in jeopardy by the sacrifice of the whole, whenever there is failure of a part."

Weller v. New York, 268 U. S. 319.
State of Washington v. Parmenter, 50 Wash. 164.

Adams v. Standard Oil Co., 97 Miss. 879.
Smith v. Wilkins, 164 N. C. 135.
Brazee v. Michigan, 241 U. S. 340.
State v. Elba Bank & Trust Company, 18 Ala. App. 253.
Johnson v. Long Furniture Company, 113 Miss. 373.

The case would seldom arise where an exemption could be deleted without leaving a workable act.

> "An exemption, which was invalid, was alone taken from it. It is only when different clauses of an act are so dependent upon each other that it is evident the legislature would not have enacted one of them without the other—as when the two things provided are necessary parts of one system—that the whole Act will fall with the invalidity of one clause."

Little Rock etc. Ry. v. Worthen, 120 U. S. 97.
Florida Cent. R. Co. v. Schutte, 103 U. S. 118.
St. Louis Southwestern Ry. Co. v. Arkansas, ex rel. Norwood, 235 U. S. 350.
Berea College v. Kentucky, 211 U. S. 45.
Fairley v. City of Duluth, 150 Minn. 374.

Section 11 of the Act provides that if any part thereof be judged invalid such adjudication shall not affect the validity of the remainder of the act. Although this Court has held a like provision not an inexorable command (Dorchy v. Kansas, 264 U. S. 286), it is nevertheless given weight by the courts (Weller v. New York, 268 U. S. 319), and the rule is well expressed in State v. Clausen, 65 Wash. 156, where the court said:

> "Anything the legislature could have eliminated

itself and left an operative act can be eliminated by the courts without destroying the entire act, if it is the will of the legislature that the remaining parts of the act shall stand after such elimination."

In Williams v. Standard Oil Company, 278 U. S. 235, this Court, speaking through Mr. Justice Sutherland, said that the effect of such a declaration as contained in Section 11 of this act is to create the presumption of separability:

> "That is to say, we begin, in the light of the declaration, with the presumption that the legislature intended the act to be divisible; and this presumption must be overcome by considerations which make evident the inseparability of its provisions or the clear probability that, the invalid part being eliminated, the legislature would not have been satisfied with what remains."

It is urged that the failure of the legislature in regular session to enact a tax bill there introduced as House Bill No. 44, which was similar to that here considered except that it did not include the provisions of Section 5, manifests that without the inclusion of Section 5 the act would not have passed. The bill so introduced in regular session did not come to final vote, but was withdrawn by its sponsors (R. 101). Whether House Bill No. 44 would have passed if pressed to final vote is a matter of conjecture and courts will not resort to speculation as to the purpose of the legislature in order to defeat an act; nor may the proclamation of the governor be considered in an attempt to discern the motivations which governed the action of the legislature. The

oft repeated declaration of the state court that an act will not be declared unconstitutional unless the invalidity appears beyond a reasonable doubt (Chambers v. McCollum, 47 Idaho 74; In re Edwards, 45 Idaho 676), is to be considered as embracing within its reason and scope, the question of whether an entire act must fail because some provision thereof must be deleted.

POINT III

THE TAX ACT IS IN CONFORMITY WITH SECTION 16 OF ARTICLE III OF THE CONSTITUTION OF IDAHO—IN THAT THE ACT EMBRACES BUT ONE SUBJECT AND MATTERS PROPERLY CONNECTED THEREWITH, WHICH SUBJECT IS EXPRESSED IN THE TITLE.

Summary.

(1). The single subject contained in the act is the tax here in question, since an exemption from the tax is but a restriction or qualification of the levy, and naturally and inherently germane thereto. The state court has construed the language of section 5 of the act to create a mere exemption and not a subsidy (Williams v. Baldridge, supra).

(2). The tax imposed is measured only by electrical energy generated for barter, sale, or exchange, as expressed in the title.

Argument.

Section 16, Article III, of the Constitution of Idaho, provides:

> "Every act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title. * * *"

An able discussion of this constitutional provision is set forth in Pioneer Irrigation District v. Bradley, 8 Idaho 310, as follows:

> " 'If the provisions of a statute all relate directly or indirectly, to the same subject, have a natural connection, and are not foreign to the subject expressed in the title, it is permissible to unite them in the same act. The objections should be grave, and the conflict between the constitution and statute palpable, before the judiciary should disregard a legislative enactment upon the sole ground that it embraces more than one subject.' * * * 'Provisions of an act may be numerous; but, however numerous, if they can be, by fair intendment, considered as falling within the subject matter of legislation, or necessary as ends and means to the attainment of the subject, the act will not conflict with the constitution.' * * * * * * it was not intended to obstruct honest legislation, or to prevent the incorporation into a single act of the entire statutory law upon one general subject.' "
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> State v. Dolan, 13 Idaho 693; Hailey v. Huston, 25 Idaho 165; Kessler v. Fritchman, 21 Idaho 30; State v. Banks, 37 Idaho 27; State ex rel Taylor v. Mirabel, 33, New Mexico 553).

Before further considering the above contention of plaintiff, we desire to point out that the prohibition in

the constitution is against a legislative enactment containing more than one *subject* and not against it containing two or more objects (State ex rel. Taylor v. Mirabel, supra). Both the alleged subjects have to do with the tax. The application of the credits on the power bill of a consumer is simply the means for carrying out the exemption, and consequently sufficiently germane to be included in the same act. Bearing in mind that the constitutional requirements are met "if the provisions of a statute * * * have a natural connection, and are not foreign to the subject expressed in the title," the act properly contains all the law in the State of Idaho on the general subject of a tax on the generation of electrical energy. Eliminate the tax and no reason appears for the exemption. Without the exemption, the provision for application of credits on the power bill of the consumer is rendered nugatory. We need only to apply the test set forth in Utah Mortgage Loan Corporation v. Gillis, 49 Idaho 676, cited by appellant, of deleting one claimed subject from the act and determining whether the balance constitutes an independent subject. The facts are dissimilar to State v. Banks, Hailey v. Huston, or Utah Mortgage Loan Co. v. Gillis, cited by appellant.

The next contention is that the act contains a subject is not expressed in the title, in that by the title the tax is levied on electricity and electrical energy generated, manufactured or produced for barter, sale or exchange whereas the act levies upon the producer of electrical energy for barter, sale or exchange, a tax measured by

all kilowatt hours generated, manufactured or produced by him. The pertinent parts of the title and act are as follows:

> "An act levying a license tax * * * on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange. * * *"

Section 1 provides in part as follows:

> "* * * each and every individual, firm, * * * engaged * * * in the generation, manufacture or production of electricity and electrical energy in the State of Idaho * * * for barter, sale or exchange, shall * * * pay a license tax of one-half (½) mill per kilowatt hour on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production * * *."

Section 11 of the act requires the producer to pay the tax on "such electricity and electrical energy so generated" and the only producer required to pay the tax is one who generates for barter, sale or exchange. Were plaintiff generating solely for its own use, it would not come within the legislative classification of those required to pay the tax. Plaintiff concedes that the title refers only to electrical energy produced for barter, sale or exchange. By reference, therefore, to either the forepart of Section 1 or the title of the act, "such electricity and electrical energy so generated, manufactured or produced," can only be held to include that which is generated for barter, sale, or exchange (Opinion Statutory Court, R. 31-32).

The general rule for the guidance of the courts in interpreting a statute is that the court may take into consideration the reason for the law, the object and the purpose thereof in contemplation of the legislative body (State v. Bowman, 40 Idaho 470; Weaver v. Rambow, 37 Idaho 645; Rural H. S. Dist. No. 1 v. School Dist. No. 37, 32 Idaho 325).

The title of an act may not control the plain language of the enacting clauses, we may look to the declared scope and purpose of the act as evidenced by its title whenever it becomes necessary in view of the use of language incapable by itself of exact construction (White v. United States, 191 U. S. 545; State v. Paulsen, 21 Idaho 686; Curoe v. Spokane Etc. R. R. Co., 32 Idaho 643; Church of Holy Trinity v. United States, 143 U. S. 457; Coosaw Min. Co. v. South Carolina, 144 U. S. 563).

In Coosaw Mining Company v. South Carolina (supra) this court said:

> "While express provisions in the body of an Act cannot be controlled or restrained by the title or preamble, the latter may be referred to when ascertaining the meaning of a statute which is susceptible of different constructions. In United States v. Fisher, 6 U. S. 2 Cranch 358, 386 (2: 304, 313) Chief Justice Marshall said: 'Neither party contends that the title of an Act can control plain words in the body of that statute; and neither denies that, taken with other parts, it may assist in removing ambiguities. Where the intent is plain, nothing is left to construction. Where the mind labors to discover the design of the Legislature it seizes everything from which aid can be derived;

> and in such case the title claims a degree of notice, and will have its due share of consideration.' United States v. Palmer, 16 U. S. 3 Wheat, 610, 631 (4: 471, 477). This rule is especially applicable in states whose constitutions, like that of South Carolina, provide that 'every Act or resolution, having the force of law, shall relate to but one subject, and that shall be expressed in the title.' "

The amount of tax accruing under Section 1 is limited by the expression in the title. In State v. Pasta, 44 Idaho 671, the state court said:

> "The object of the title of an act is to give a general statement of the subject matter contained therein, *and the act must not be so construed as to extend its effect beyond the limits fixed in the title.*

Had the legislature intended to tax all electrical energy regardless of the purpose for which it is produced, no reason could appear for inserting the phrase "for barter, sale or exchange" in the title and requiring by Section 1 only producers of electrical energy for barter, sale and exchange to pay the tax? If any ambiguity exists, it arises from the term "such electricity * * * so generated * * *." The title must then be consulted to determine the scope and meaning of the phrase and "the act must not be so construed as to extend its effect beyond the limits fixed in the title." If a statute is susceptible of two constructions, one which would uphold it, and the other render it unconstitutional, the former should be adopted and the doubt resolved in favor of the validity of the act (Smallwood v. Jeter, 42 Idaho 169; Griffith v. Owens, 30 Idaho 647).

Appellant then insists that the act is broader than the subject expressed in the title because the exemption includes line losses while the title exempts only the energy actually used for pumping water for irrigation purposes. The title in this respect provides that the electrical energy actually used for pumping shall be exempt and the exemption accrue to the benefit of the consumer.

The first portion of Section 5 is identical in import and practically so in language. Both title and act, in referring to the exemption, use the expression "such electricity and electrical energy" which can only refer to electricity and electrical energy used for pumping water for irrigation purposes. The second proviso, in Section 5, reads as follows:

> "Provided further that the full amount of such license tax which would have been due from such producers of electricity and electrical energy, if such exemptions had not been made, shall be credited annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity and electrical energy, furnishing such power * * *."

This proviso clearly refers to credit being given for tax exempt electrical energy, identically the same amount set forth in the title and the forepart of Section 5. This fact is made clear by the use of the expression "*such license tax* which would have been due * * *." "Such license tax" and "such exemption" can only refer to the identical amount set forth in Section 5 and in the title as exempt. The second proviso is simply the

means of carrying into effect the identical exemption; the title sets forth the topic and the act treats it.

In State v. Dolan, 13 Idaho 693, the State Supreme Court said:

> "It (the title) plainly indicated the object and purpose of the act, which is all the constitution requires. The subject of a statute is one thing and its detailed provisions quite another; one is the topic, the other its treatment; one is required to be stated in the title, the other is not."

Quoting from Turner v. Coffin, 9 Idaho 338, the court further said:

> "It seems to have been generally recognized by the authorities as the intention of the framers of such a constitutional provision to require a title sufficiently definite and comprehensive as to indicate to one reading it the general scope and purpose of the legislation intended by the act, and that if the title be sufficient for that purpose it will be held as including all necessary and incidental legislation necessary to make the general purpose of the act operative."

Appellant's contention of a difference in the quantity of energy "actually used" and that taxable at the place of production assumes that the act will be construed to provide a greater credit than exemption. If the language of the act considered does not compel such a construction the point asserted is without merit.

> "Anyone reading the title would be advised of the proposed legislation; no one could be deceived or misled as to what the legislature intended to do in a general way. It does not conceal or cover up

> any secret intent of the legislature. * * * A reasonable and common-sense construction must be given to this act, and when such construction is placed upon it we readily see what the legislature intended by the title and the provisions of the act" (State v. Dolan, supra).

A common-sense construction of the title and Section 5 repels the conclusion that the legislature intended the credit of the exemption to be any greater than the amount of the tax accruing had the exemption not been made. The question arising from system losses will be discussed under Point IV, infra.

POINT IV

THE TAX IS NOT SO UNCERTAIN AS TO REQUIRE ARBITRARY ADMINISTRATIVE ACTION AND THUS TAKE APPELLANT'S PROPERTY WITHOUT DUE PROCESS OF LAW, BUT PROVIDES AN ADEQUATE STANDARD FOR THE COMPUTATION OF THE TAX.

Summary.

(a) The act provides that the tax shall be measured only by kilowatt hours generated or produced for barter, sale or exchange in the operation of Appellant's system. The amount of electrical energy generated for this purpose is ascertainable, and the basic measurement must be made at the place of production.

(b) The act is sufficiently definite where for reasons found to result either from the text of the statutes

involved or the subjects with which they deal, a reasonable standard was afforded (Mahler vs. Eby, 264 U. S. 32; United States vs. Brewer, 139 U. S. 278, 288; Miller vs. Strahl, 239 U. S. 426, 434; Nash vs. United States, 229 U. S. 373; Omaechevarria vs. Idaho, 246 U. S. 343).

(c) The exemption provided by Section 5 may be definitely determined where, as here appears, amounts generated, delivered to consumers, used by Appellant, or lost in transit, may be readily computed.

Argument.

That the Act provides for measurement of the tax only by amounts of electrical energy generated for barter, sale or exchange is, we think, suficiently discussed under Point III, supra. The Act provides for the installation of meters and the payment of a tax on electrical energy "measured at the place of production." The provision emphasizes the intent to tax only production and not transportation or sale; and insures the basic measurement required. That in order to an ascertainment of amounts generated "for barter, sale or exchange," other data may be required, is not offensive to the purpose served by such provision under the statute. Having manifested its intent not to include in the basis of measurement any amounts generated by the producer for its own use and not for sale, the legislature must be considered to have contemplated the fact that gross output was not the factor to be used, and the resultant necessity of further computations. No

other construction is permissible, and thus viewed, no ambiguity exists. In every phase of its operations Appellant can compute exact amounts. The Bill of Complaint pleads amounts generated, sales in Idaho, transmission, etc., losses pertaining to business in Idaho and station use in Idaho (R. 4). Appellant can definitely ascertain amounts delivered to any point on its system or losses between any points (Mr. Hale, R. 173-4; Dr. Magnusson, R. 201; Mr. Rupp, R. 211). The question of whether the tax is measured only by electrical energy generated for barter, sale or exchange is one of law rather than fact. It is not, therefore, left to the discretion of the Commissioner nor subject to arbitrary interpretation by him. The suggestion made that the state must thus go beyond its territorial jurisdiction in obtaining the data necessary for such computation is answered by this Court in American Manufacturing Company v. St. Louis and Hope Natural Gas Company v. Hall, where the tax could not be assessed until there had first been ascertained the amount of receipts from sales made by the taxpayer both within and without the state.

In Adams v. Greene, 182 Ky. 504, the court said:

> "A statute will not be held void for uncertainty if any sort of practical or sensible construction may be given it. Mere difficulty in ascertaining its meaning, or the fact that it is susceptible of two interpretations will not render it nugatory * * *"

(State ex rel. Toomey v. State Board of Examiners, 74 Mont. 1; Waters-Pierce Oil Company v. Texas, 212

U. S. 86; Alaska Pacific Fisheries v. Territory of Alaska, 236 Fed. 70, affirmed 242 U. S. 648.)

In State v. Livingston Concrete Bldg. & Mfg. Company, 34 Mont. 570, the court said:

> "While it may be conceded that the intention of the lawmakers might have been expressed in plainer terms, we cannot hold a solemn legislative enactment of no force or effect because of the indefinite language in which it is couched, unless we find ourselves unable to divine the purpose or intent of the legislature. * * * For, after all, the function of the court is to determine and make known, if possible, such purpose or intent; for the intention of the legislature is the essence of the law. * * *"

A similar construction, as adopted by the state court in State of Idaho vs. Omaechevarria, 27 Idaho 797, was sustained by this court in Omaechevarria vs. Idaho, 246 U. S. 343, where it was held that:

> There is no such indefiniteness in the provisions of Idaho Rev. Codes 1908, sec. 6872, making criminal the grazing of sheep on the Federal public domain on ranges previously occupied by cattle, or usually occupied by cattle raisers, as to render such statute repugnant to the constitutional guaranty of due process of law, although it fails to provide for the ascertainment of the boundaries of a range, or for determining what length of time is necessary to constitute a prior occupation a usual one within the meaning of the statute, — especially since it is provided by sec. 6314, that in any crime or public offense there must exist a union or joint operation of act and intent, or criminal negligence.
>
> (Hygrade Provision Company v. Sherman 266 U. S. 497, 502.)

In Standard Oil Company v. Brodie, 153 Ark. 114 (followed in Pierce Oil Corporation v. Hopkins, 264 U. S. 137, 139), the court had under consideration a tax act, Section 1 of which provides that all persons selling gasoline to be used by the purchaser in propelling motor vehicles over the highways should collect from the purchaser in addition to the usual charge the sum of one cent per gallon, and in response to a contention similar to that urged here, the court said:

> "Finally, it is argued that the law is vague and uncertain—so much so that it is incapable of enforcement. The interpretation, which we have given to the statute, and which, we think is a fair and reasonable one, relieves it from this charge of uncertainty, for we think that it means what we have stated in this opinion, and that it can be readily understood.
>
> "The fact that there may be be a difference of opinion as to the meaning of the language of a statute does not render it too vague or uncertain to be enforceable. It is not infrequent that statutes have to be construed by the courts before laymen, or even lawyers, have a settled view as to the proper interpretation, but a statute which is fairly susceptible to definite interpretation is not too vague for enforcement."

A construction of the Commissioner is not ground for enjoining any enforcement of the Act. If the Act shall be construed to mean that amounts of electrical energy consumed in energizing the system are not to be included in the factor by which the tax is measured, the tax is still ascertainable; an adequate standard is afforded. The assertion that ascertainment of losses with respect

to energy delivered to that part of the system located in Utah and energy originating in Utah is mathematically insolvable disregards the essential fact that system losses or system uses are determinable with an accuracy that satisfies the requirements of the statute and protects the interests of Appellant. That, in the common assessment of ad valorem taxes, the assessor is not infallible and cannot be expected to know or be able to ascertain with exactness the full cash value of every parcel of property has never been considered to vitiate the tax. Nor is this ground of contention consonant with the averment of precise amounts of "transmission, distribution and sub-station losses pertaining to business in Idaho" (R. 4). When considered in connection with the fact that "there is normally in the aggregate an excess of capacity in the local Idaho station over the Idaho demand" (Mr. Hale, R. 166) and that "the flow of power generally was into Grace Station from Idaho Falls, rather than out of Grace Station toward Idaho Falls" (Mr. Cheever, R. 146), the conclusion is warranted that although amounts of energy destined for the Utah system are commingled with amounts generated for Idaho users, we perceive that relative losses may be ascertained with practical accuracy. This statute has not yet been construed by the Supreme Court of the state, nor will the Federal Supreme Court assume in advance that a state court will so construe a statute as to render it obnoxious to the Federal Constitution (Arizona Copper Company v. Hammer, 250 U. S. 400).

The ambiguity claimed with relation to Section 5, is resolved, if in point of law, it be considered that the credit to be applied upon the power bill of the consumer is intended only as exactly equivalent to the amount of the exemption. If it be necessary to take into consideration losses incident to the delivery of power for pumping purposes, we have seen that such losses may be ascertained. The statement of Mr. Gadsby that the company is wholly unable to ascertain the location of the lands to be irrigated by the user to whom it delivers power for pumping purposes must be answerable by the fact that in common understanding and either through survey of the premises or statement of the consumer such information is certainly obtainable. It may be further observed that the testimony thus offered was without the scope of the order and decision of the Statutory Court limiting the evidence to be taken to the issues arising under the Commerce Clause.

So far as the severity of the penalty provisions may serve to bring this claimed uncertainty to sharper view, the provisions of section 7 of the Tax Act with respect to false certificates cannot be considered apart from section 8087 of the Compiled Statutes of Idaho (formerly R. C. 6314) which declares that "In every crime or public offense there must exist a union, or joint operation, of act and intent, or criminal negligence" (State v. Omaechevarria, supra). But this is not an action for collection of tax or penalty. In the Ohio Tax Cases, 232 U. S. 576, 594, (followed in Phoenix Railway Co. of Arizona v. Geary, 239 U. S. 277), this court said:

"But these actions do not involve any present attempt to enforce the penalties, and the act contains a section which in terms declares: 'the sections of this act and every part of such sections are hereby declared to be independent sections and parts of sections, and the holding of any section or part thereof to be void or ineffective shall not affect any other section or part thereof.' The penalty clauses, if themselves unconstitutional, are severable, and there is, therefore, no presnt occasion to pass upon thir validity" (citing cases).

In Pierce Oil Corp. v. Hopkins, supra, the tax act made failure to file the report or pay the tax a misdemeanor.

In State v. Bird, 29 Idaho 47, where the provision for imprisonment in addition to fine for operation without a license was held without warrant in law, the remainder of the act was enforced. It can not be considered from the terms of the statute and the facts with which they deal that the court cannot interpret the act with such certainty that there is no question of the taxpayer's liability and obligation. An act will not be declared inoperative and ineffectual on the ground that it furnishes no adequate means to secure the purpose for which it is passed, if men of common sense and reason can devise and provide the means, and all the instrumentalities necessary for its execution are within the reach of those intrusted therewith. Detroit v. Rush, 82 Michigan 532. "The method adopted would seem to be reasonably fair and accurate, as much so, at least, as most methods in use for computing taxes on the profits of business, which are universally upheld." South Carolina cases, 52 Fed. (2nd) at 522.

CONCLUSION

We respectfully urge that the decree of the Court below should be affirmed.

Respectfully submitted,

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APPENDIX

CHAPTER 3

(H. B. No. 3)

AN ACT

LEVYING A LICENSE TAX OF ONE HALF MILL PER KILOWATT HOUR ON ELECTRICITY AND ELECTRICAL ENERGY GENERATED, MANUFACTURED OR PRODUCED IN THE STATE OF IDAHO FOR BARTER, SALE OR EXCHANGE; AND PROVIDING FOR THE COLLECTION AND DISTRIBUTION OF SUCH TAX; AND FOR FORMS AND PROCEDURE TO BE USED AND FOLLOWED; REQUIRING REPORTS OF THE PRODUCTION OF ELECTRICITY AND ELECTRICAL ENERGY AND THE FURNISHING OF EQUIPMENT FOR MEASURING SAME; PRESCRIBING PENALTIES FOR VIOLATION OF THIS ACT; EXEMPTING FROM SUCH LICENSE TAX THE ELECTRICITY AND ELECTRICAL ENERGY ACTUALLY USED FOR PUMPING WATER FOR IRRIGATION PURPOSES ON LANDS IN THE STATE OF IDAHO AND PROVIDING THAT SUCH EXEMPTIONS SHALL ACCRUE TO THE BENEFIT OF THE CONSUMER OF SUCH ELECTRICITY AND ELECTRICAL ENERGY; PRESCRIBING THE DUTIES OF THE STATE COMMISSIONER OF LAW ENFORCEMENT UNDER THIS ACT, REQUIRING HIM TO GIVE A BOND FOR THE FAITHFUL PERFORMANCE OF SAID DUTIES AND FIXING THE AMOUNT THEREOF, AND MAKING AN APPROPRIATION WITH WHICH TO CARRY OUT ITS PURPOSES.

Be It Enacted by the Legislature of the State of Idaho:

SECTION 1. That in addition to the licenses and taxes now provided by law, each and every individual, firm, partnership, common law trust, corporation, association or other organization, now engaged or hereafter to engage in the generation, manufacture or production of electricity and electrical energy in the State of Idaho, either through water power or by any other means for barter, sale, or exchange, and hereinafter referred to as the "producer", shall on or before the fifteenth day of each calendar month, beginning with the 15th day of July, 1931, render a statement to the Commissioner of Law Enforcement of the State of Idaho of all electricity and electrical energy generated, manufactured or produced by him or it in the State of Idaho, during the preceding calendar month and therewith pay a license tax of one-half (½) mill per kilowatt hour on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production and as shown on such statement in the manner and within the time hereinafter provided.

SEC. 2. Said license tax shall be remitted with the statement and paid on or before the fifteenth day of each month, beginning with July 15, 1931, to the Commissioner of Law Enforcement, who shall receipt therefor and promptly turn same over to the State Treasurer, as other receipts of his office, and the State Treasurer shall place same to the credit of the General Fund. Taxes not paid on the due date shall become delinquent and shall bear interest from said due date at the rate of ten per cent per annum.

SEC. 3. On or before July 15, 1931, every producer referred to in Section 1 of this Act engaged in the production, generation or manufacture of electricity or electrical energy, shall make and file with the Commissioner of Law Enforcement of the State of

Idaho, on forms prescribed, prepared and furnished by the Commissioner of Law Enforcement, a duly acknowledged and verified certificate which shall contain: (a) the name under which the producer is transacting business in the State of Idaho; (b) his or its post office address and principal place of business within the state; (c) the address and location of his or its production plants or stations in Idaho; (d) the name and address of the managing agent; (e) the names and addresses of the several persons composing any firm or partnership constituting the producer, and, if a corporation, the corporate name under which it is authorized to transact business and the names and addresses of its officers, directors, resident general agent and attorney in fact; (f) certified copies of any papers necessary to show that such producer has complied with the laws of the State of Idaho in order to transact business in Idaho.

SEC. 4. Every such producer shall on or before the fifteenth day of each calendar month, beginning with July 15, 1931, and monthly thereafter, render to the Commissioner of Law Enforcement of the State of Idaho on forms prescribed, prepared and furnished by the Commissioner of Law Enforcement, a statement sworn to by the manager, president, secretary or treasurer of such producer, showing the number of kilowatt hours of electricity and electrical energy produced, generated or manufactured by him or it during the preceding calendar month. For the purpose of measuring such electricity and electrical energy such producer shall keep and maintain at the point or points of production, a recording watt hour meter or meters, or other suitable instrument for measuring the electricity or electrical energy produced, of a type to be approved by the Commissioner of Law Enforcement, the recordings therefrom to be kept on file at the principal place of business of such producer within the State of Idaho and same together with the books and records of such producer shall be subject to the inspection of the Commissioner of

Law Enforcement, his deputies or assistants, during reasonable business hours.

SEC. 5. All electricity and electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho is exempt from the provisions of this Act, except in cases where the water so pumped is sold or rented to such irrigated lands. Provided, the exemption here given shall accrue to the benefit of the consumer of such electricity or electrical energy. Provided further that the full amount of such license tax which would have been due from such producers of electricity and electrical energy, if such exemptions had not been made, shall be credited annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity and electrical energy, furnishing such power, and such producer shall include a statement of the amount of electricity and electrical energy exempted by this section, furnished by it for the purpose of pumping water for irrigation purposes on lands in the State of Idaho, to the commissioner of Law Enforcement of the State of Idaho as a part of the statement required by Section 1 of this Act, together with a statement of the credits made on the power bills to the consumers of such electricity and electrical energy for the pumping of water for irrigation to be used on lands in the State of Idaho.

SEC. 6. Any producer of electricity or electrical energy referred to in Section 1 of this Act who shall hereafter engage in the generation, production or manufacture of electricity or electrical energy shall immediately upon purchasing or acquiring the plant, or installing equipment therefore, comply with the requirements of Section 3 of this Act.

SEC. 7. Any person, officer, partner, agent or representative of any producer referred to in Section 1 of this Act, who shall make any false statement or affidavit in any certificate, report or statement herein required to be made to the Commissioner of Law Enforcement hereunder shall be deemed guilty of

perjury and upon conviction shall be punished by imprisonment in the state penitentiary not less than one nor more than fourteen years.

SEC. 8. Any producer referred to in Section 1 of this Act who shall violate any of the provisions of this Act or who shall fail to pay the license tax herein provided for, or any part thereof, when due shall be liable for three times the amount of the unpaid or delinquent tax, in a civil action instituted for that purpose in any court of competent jurisdiction, by the Commissioner of Law Enforcement in the name of the State of Idaho, and in such suit upon application of the State, an injunction may be issued, without requiring any bond, restraining the defendant from continuing to produce electricity or electrical energy so long as any taxes due hereunder from said defendant remain delinquent.

SEC. 9. The State Treasurer shall, on or before the twentieth day of August of each year, beginning with August 20, 1931, prepare and furnish to the chairman of the State Board of Equalization a statement showing the total amount paid into the General Fund for the year ending August 15th of such year from the license tax provided by this Act, and the State Board of Equalization shall deduct such total amount so paid in determining the ad valorem tax for state purposes on real and personal property.

SEC. 10. In addition to any bond provided by law to be given by the Commissioner of Law Enforcement for the faithful performance of his duties, he shall give a fidelity bond in the penal sum of $50,000.00 to the State of Idaho, in the form and manner provided by law for similar bonds of state officers, and duly conditioned for the faithful performance of his official duties prescribed by this Act.

SEC. 11. If any section or provision of this Act be adjudged unconstitutional or invalid for any reason, such adjudication shall not affect the validity of this Act as a whole or of any section or provision thereof

which is not specifically so adjudged unconstitutional or invalid.

SEC. 12. There is hereby appropriated out of any moneys in the General Fund, not otherwise appropriated, the sum of Fifteen Thousand Dollars ($15,000.00) or so much thereof as may be necessary, with which to carry out the purposes of this Act.

Approved March 17, 1931.

SUPREME COURT OF THE UNITED STATES.

No. 722.—October Term, 1931.

Utah Power and Light Company, Appellant, *vs.* Emmitt Pfost, Commissioner of Law Enforcement of the State of Idaho, et al.	Appeal from the District Court of the United States for the District of Idaho.

[May 16, 1932.]

Mr. Justice Sutherland delivered the opinion of the Court.

The Utah Power & Light Company is a Maine corporation doing business in the states of Idaho, Utah and Wyoming, under the laws of those states. The corporation is a public utility engaged in generating, transmitting and distributing electric power and energy for barter, sale and exchange to consumers in each of these three states and in interstate commerce among them. The present suit was brought to enjoin the enforcement of an act of the Idaho legislature, levying a license tax on the manufacture, generation or production, within the state, for barter, sale or exchange, of electricity and electrical energy. Laws of Idaho, 1931 (Extraordinary Session), c. 3.

Section 1 of the act provides that any individual, corporation, etc., engaged in the generation, manufacture or production of electricity and electrical energy, by any means, for barter, sale or exchange, shall, at a specified time, render a statement to the Commissioner of Law Enforcement of all electricity and electrical energy generated, manufactured or produced by him or it in the state during the preceding month, and pay thereon a license tax of one-half mill per kilowatt hour, "measured at the place of production." Sections 2, 3 and 4 provide for the time and method of payment of the tax and the furnishing of appropriate information. Section 4 further requires the producer to maintain, at the point or points of production, suitable instruments for measuring the electricity or electrical energy produced. Section 5, which is the subject of a distinct attack, provides:

"All electricity and electrical energy used for pumping water for irrigation purposes to be used on lands in the State of Idaho is exempt from the provisions of this act, except in cases where the water so pumped is sold or rented to such irrigated lands. Provided, the exemption here given shall accrue to the benefit of the consumer of such electricity or electrical energy. Provided further that the full amount of such license tax which would have been due from such producers of electricity and electrical energy, if such exemptions had not been made, shall be credited annually for the year in which the exemptions are made on the power bill to the consumer by the producer of such electricity and electrical energy, furnishing such power, and such producer shall include a statement of the amount of electricity and electrical energy exempted by this section, furnished by it for the purpose of pumping water for irrigation purposes on lands in the State of Idaho, to the Commissioner of Law Enforcement of the State of Idaho as a part of the statement required by Section 1 of this Act; together with a statement of the credits made on the power bills to the consumers of such electricity and electrical energy for the pumping of water for irrigation to be used on lands in the State of Idaho."

Section 8 imposes a penalty for any violation of the act, or failure to pay the license tax provided for therein when due, in the sum of three times the amount of the unpaid or delinquent tax, to be recovered by civil action. Section 11 provides that if any section or provision of the act be adjudged unconstitutional or invalid, such adjudication shall not affect the validity of the act as a whole or of any section or provision thereof not specifically so adjudged unconstitutional or invalid.

After the filing of the complaint an interlocutory injunction was granted (52 F. (2d) 226); and, thereafter, appellees answered. Upon the evidence reported by a master, to whom the case had been referred, the court below (composed of three judges as required by law) made findings of fact and conclusions of law and entered a final decree dissolving the interlocutory injunction and requiring appellant to pay the tax in question with interest, but without any penalties which might have accrued during the pendency of the suit. 54 F. (2d) 803. This appeal followed.

The validity of the act under the federal and state constitutions is assailed upon four grounds: (1) that it imposes a direct burden on interstate commerce in violation of clause 3, § 8, Art. I of the federal Constitution; (2) that it denies appellant the equal pro-

tection of the laws and deprives it of property without due process of law in violation of the Fourteenth Amendment and of a corresponding provision of the state Constitution, in that § 5 of the act compels the appropriation and payment of money by appellant for the benefit of private individuals, and that, § 5 being unconstitutional, the act as a whole must fall; (3) that the act violates § 16, Art. 3 of the state Constitution, which provides that every act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title; (4) that the act is so uncertain and ambiguous in specified particulars that its enforcement is left to arbitrary administrative action without a legislative standard, and thus violates the due process of law clause of the Fourteenth Amendment.

First. Appellant contends that the tax is not one on manufacture or production or on the extraction of a product of nature, but on the transfer or conveyance of energy in nature from its source to its place of use; that in part appellant's system consists of generating stations in Idaho and transmission lines across the boundary into Utah, and thence to various consumers, the combined action of which constitutes an operation in interstate commerce; that the energy is brought to the consumers in Utah directly from its source in the water fall; that thus the generator is an instrumentality of interstate commerce; that the process of generation is simultaneous and interdependent with that of transmission and use, and because of their inseparability the whole is interstate commerce; that since the intent of the act is to tax the whole business, and no provision is made for the separate determination of interstate and intrastate business, the act, in burdening interstate commerce, is void in its entirety.

On the other hand, appellees say that the tax is laid upon the generation of electrical energy as a distinct act of production, and without regard to its subsequent transmission; that the process of generation is one of converting mechanical energy into electrical form; that the resulting change is substantial and is a change in the physical characteristics of the energy in respect of voltage, current, and character as alternating or direct current, according to the design of the mechanical generating devices; that the process of conversion is completed before the pulses of energy leave the generator in their flow to the transformer; that

the tax is measured by the amount of electrical energy generated, without regard to its subsequent transmission; that such transmission is subsequent to, and separable from, generation, and, in effect, corresponds to the transportation of goods after their manufacture; that the generation of the electrical energy is local, and only its transmission is in interstate commerce; that since the tax is imposed in respect of generation, it is not invalidated by reason of any intent on the part of the producer to transport across state lines.

In the light of what follows, we find it unnecessary to state or consider the claims of the parties as to the effect of the interposition of the transformer between the generator and the places of consumption.

From the foregoing greatly abbreviated but, for present purposes, we think sufficient statement of the views of the respective parties, it is apparent that in the last analysis the question we are called upon to solve is this: Upon the facts of the present case is the generation of electrical energy, like manufacture or production generally, a process essentially local in character and complete in itself; or is it so linked with the transmission as to make it an inseparable part of a transaction in interstate commerce? From the strictly scientific point of view the subject is highly technical, but in considering the case, we must not lose sight of the fact that taxation is a practical matter and that what constitutes commerce, manufacture or production is to be determined upon practical considerations.

Electrical energy has characteristics clearly differentiating it from the various other forms of energy, such as chemical energy, heat energy, and the energy of falling water. Appellant here, by means of what are called generators, converts the mechanical energy of falling water into electrical energy. Thus, by the application of human skill, a distinct product is brought into being and transmitted to the places of use. The result is not merely transmission; nor is it transmission of the mechanical energy of falling water to the places of consumption; but it is, first, conversion of that form of energy into something else, and, second, the transmission of that something else to the consumers. While conversion and transmission are substantially instantaneous, they are, we are convinced, essentially separable and distinct operations.

The fact that to ordinary observation there is no appreciable lapse of time between the generation of the product and its transmission does not forbid the conclusion that they are, nevertheless, successive and not simultaneous acts.

The point is stressed that in appellant's system electricity is not stored in advance but produced as called for. The consumer in Utah, it is said, by merely turning a switch, draws directly from the water fall in Idaho, through the generating devices, electrical energy which appears instantaneously at the place of consumption. But this is not precisely what happens. The effect of turning the switch in Utah is not to draw electrical energy directly from the water fall, where it does not exist except as a potentiality, but to set in operation the generating appliances in Idaho, which thereupon receive power from the falling water and transform it into electrical energy. In response to what in effect is an order, there is production as well as transmission of a definite supply of an article of trade. The manufacture to order of goods and their immediate shipment to the purchaser furnishes a helpful analogy, notwithstanding the fact that there the successive steps from order to delivery are open to physical observation, while here the succession of events is chiefly a matter of inference—although inference which seems unavoidable. The process by which the mechanical energy of falling water is converted into electrical energy, despite its hidden character, is no less real than the conversion of wheat into flour at the mill.

The apparent difficulty in perceiving the analogy arises principally from the fact that electrical energy is not a substance—at least in common meaning. It cannot be bought and sold as so many ounces or pounds, or so many quarts or gallons. It has neither length, breadth nor thickness. But that it has actual content of some kind is clear, since it is susceptible of mechancial measurement with the necessary certainty to permit quantitative units to be fixed for purposes of barter, sale and exchange. However lacking it may be in body or substance, electrical energy, nevertheless, possesses many of the ordinary tokens of materiality. It is subject to known laws; manifests definite and predictable characteristics; may be transmitted from the place of production to the point of use and there made to serve many of the practical needs of life.

We think, therefore, it is wholly inaccurate to say that appellant's entire system is purely a transferring device. On the contrary, the generator and the transmission lines perform different functions, with a result comparable, so far as the question here under consideration is concerned, to the manufacture of physical articles of trade and their subsequent shipment and transportation in commerce. Appellant's chief engineer, although testifying that generation is a part of the process of transferring energy, said on cross-examination that in the process of generation there is a "conversion of the mechanical energy in the turbine shaft into a different form of energy, that is electrical energy. It must be converted into electrical energy before it can be transmitted . . . . This process of transformation is complete at the generator, and you have a greater amount of energy there, capable of doing a greater amount of mechanical work, at the generator than you do after transmitting it into Utah." The evidence amply sustains the conclusion that this transformation must take place as a prerequisite to the use of the electrical product, and that the process of transferring, as distinguished from that of producing, the electrical energy, begins not at the water fall, but definitely at the generator, at which point measuring appliances can be placed and the quantum of electrical energy ascertained with practical accuracy.

The various specific objections to the findings made below, and the failure to adopt others suggested by appellant, become immaterial in view of our conclusions. We are satisfied, upon a consideration of the whole case, that the process of generation is as essentially local as though electrical energy were a physical thing; and to that situation we must apply, as controlling, the general rule that commerce does not begin until manufacture is finished, and hence the commerce clause of the Constitution does not prevent the state from exercising exclusive control over the manufacture. *Cornell* v. *Coyne*, 192 U. S. 418, 428-429. "Commerce succeeds to manufacture, and is not a part of it." *United States* v. *E. C. Knight Co.*, 156 U. S. 1, 12.

Without regard to the apparent continuity of the movement, appellant, in effect, is engaged in two activities, not in one only. So far as it produces electrical energy in Idaho, its business is purely intrastate, subject to state taxation and control. In trans-

mitting the product across the state line into Utah, appellant is engaged in interstate commerce, and state legislation in respect thereof is subject to the paramount authority of the commerce clause of the federal Constitution. The situation does not differ in principle from that considered by this court in *Oliver Iron Co.* v. *Lord*, 262 U. S. 172. There the State of Minnesota had imposed an occupation tax on the business of mining ores. The tax was assailed as being in conflict with the commerce clause. It appeared that substantially all the ores there in question were mined for delivery to consumers outside the state; and that the ores passed practically at once after extraction into the channels of interstate commerce. The greater part of the ores came from open pit mines, to which empty cars were run and there loaded, the ores being severed from their natural bed by means of steam shovels and lifted directly into the cars. When loaded these cars were promptly returned to the railroad yards from which they came and were there put into trains and continued their interstate journey. The several steps followed in such succession that there was practical continuity of movement from the severance of the ores to the end of their journey in another state. Upon these facts the court held that the commerce clause was not infringed.

"The ore does not enter interstate commerce," it was said, p. 179, "until after the mining is done, and the tax is imposed only in respect of the mining. No discrimination against interstate commerce is involved. The tax may indirectly and incidentally affect such commerce, just as any taxation of railroad and telegraph lines does, but this is not a forbidden burden or interference."

In *Hope Gas Co.* v. *Hall*, 274 U. S. 284, this court considered an act of the State of West Virginia imposing a tax upon the production, among other things, of natural gas. The chief business of the Hope Gas Company was the production and purchase of natural gas in West Virginia and the continuous and uninterrupted transportation of it through pipe lines into adjoining states, where it was sold, delivered and consumed. Most of it passed into interstate commerce by continuous movement from the wells where it originated. Interpreting and following the decision of the state court, it was held that the tax was to be computed upon the value of the gas at the well, and that if, thereafter, executive officers should fix values upon an improper basis appropriate relief would

be afforded by the courts. The tax was sustained as not involving an infringement of the commerce clause of the Constitution.

In the light of what we have said in respect of the character of the product here involved, the manner of its production, and the relation of such production to its interstate transmission, these cases in principle clearly control the present case and render further discussion or citation of authorities unnecessary.

Second. The attack upon § 5 of the act, which is copied on a preceding page, is based upon the contention that it does not grant an exemption but has the effect of laying a tax for the benefit of favored consumers, that is to say, of selected private persons; and that the enforcement of the section in respect of allowances of credits by the producer to the favored consumers will result in taking the money of the former and giving it to the latter. A further contention is that § 5 is an inseparable part of the act, and being unconstitutional, the entire act must fall with it. In support of the latter point, the grounds stated are that the legislative history discloses as a matter of fact that the act would not have been passed had § 5 not been included; and that it is apparent on the face of the act itself that the provisions of the section are essential and inseparable parts of the act as an entirety. It will shorten our consideration of the first point if we begin by disposing of the second point as to the question of separability.

The claim that the legislative history discloses that the act would not have passed without § 5 seems to rest entirely upon the fact that a bill for a similar act, but which did not contain the challenged section, failed of passage; but that, upon § 5 being included, the act thereafter was passed. The bill first introduced did not come to a vote, but was withdrawn from consideration by unanimous consent. That it would have been rejected if put to a vote rests upon mere supposition. There is no real ground for an opinion one way or the other. Courts are not justified in resting judgment upon a basis so lacking in substance.

Nor do we think the inseparability of the section from the rest of the act appears from the face of the legislation. The act itself (§ 11) provides that an adjudication that any provision of the act is unconstitutional shall not affect the validity of the act as a whole, or of any other provision or section thereof. While this declaration is but an aid to interpretation and not an inexorable

command (*Dorchy* v. *Kansas*, 264 U. S. 286, 290), it has the effect of reversing the common law presumption, that the legislature intends an act to be effective as an entirety, by putting in its place the opposite presumption of divisibility; and this presumption must be overcome by considerations that make evident the inseparability of the provisions or the clear probability that the legislature would not have been satisfied with the statute unless it had included the invalid part. *Williams* v. *Standard Oil Co.*, 278 U. S. 235, 241-242.

It fairly may be assumed that the Idaho legislature, in making this declaration, had in mind every provision of the act, including § 5. The primary object of the statute under review, plainly, is to raise revenue. The exemption made by § 5, and the provisions for carrying that exemption into effect are secondary. We find no warrant for concluding that the legislature would have been content to sacrifice an important revenue statute in the event that relief from its burdens in respect of particular individuals should become ineffective. On the contrary, it seems entirely reasonable to suppose that if the legislature had expressed itself specifically in respect of the matter, it would have declared that the tax, being the vital aim of the act, was to be preserved even though the specified exemptions should fall for lack of validity. *Field* v. *Clark*, 143 U. S. 649, 696-697; *People ex rel. Alpha P. C. Co.* v. *Knapp*, 230 N. Y. 48, 60-63.

In the light of these conclusions, § 5, in respect of the constitutional question, stands apart from the remainder of the act and is to be considered accordingly. The court below followed the decision of the state supreme court (*Williams* v. *Baldridge*, 48 Idaho 618), in holding that § 5 granted an exemption ultimately for the benefit of the consumers of electrical power for irrigation purposes on lands within the state. It seems to us plain that the purpose of the act was to relieve the producer from liability for the tax *pro tanto*, and to pass on to the irrigation consumers the benefit thereof to the extent—and only to the extent—of the savings effected through the exemption. There is nothing to suggest that the legislature intended to cast any additional burden upon the producer or require him to yield to the irrigation consumers anything beyond the equivalent of the exemption. The irrigation of even private lands in the arid region is a matter of

public concern (*Clark* v. *Nash*, 198 U. S. 361), and we are of opinion that an exemption of the character here involved is not precluded by the equal protection clause of the Fourteenth Amendment. Compare *Louisville Gas Co.* v. *Coleman*, 277 U. S. 32, 40.

The provisions in respect of the allowance of credits to the consumers by the producer present a question of more difficulty. If these provisions embody nothing more than a method of accounting to make sure that the irrigation consumers shall not bear, in whole or in part, the burden of the tax from which the producer is exempt, they would seem to be without fault. If by construction or in application they result in taking from the producer more than the sum of the exemption, a different question would arise. The supreme court of Idaho thus far has not construed § 5 in respect of the provisions now under consideration. The point was presented but reserved in *Williams* v. *Baldridge, supra*, p. 631. It does not appear that appellant is presently in any such danger of an unconstitutional application of these provisions of the statute as to entitle it to invoke a decision here upon the question, and the rule is well settled that "a litigant can be heard to question a statute's validity only when and so far as it is being or is about to be applied to his disadvantage." *Dahnke-Walker Co.* v. *Bondurant*, 257 U. S. 282, 289; *Oliver Iron Co.* v. *Lord, supra*, pp. 180-181; *Jeffrey Mfg. Co.* v. *Blagg*, 235 U. S. 571, 576; *Gorieb* v. *Fox*, 274 U. S. 603, 606. Primarily, the construction of these provisions of the statute is for the state supreme court, and we cannot assume in advance that such a construction will be adopted, or such an application made of the provisions, as to render them obnoxious to the federal Constitution. In *Plymouth Coal Co.* v. *Pennsylvania*, 232 U. S. 531, 544-545, 546, Mr. Justice Pitney pointed out that

"... in cases other than such as arise under the contract clause of the Constitution, it is the appropriate function of the court of last resort of a State to determine the meaning of the local statutes. And in exercising the jurisdiction conferred by § 237, Judicial Code, it is proper for this court rather to wait until the state court has adopted a construction of the statute under attack than to assume in advance that a construction will be adopted such as to render the law obnoxious to the Federal Constitution."

This was said in a case brought for review from the supreme court of a state, but the same doctrine was recognized in *Arizona Em-*

ployers' Liability Cases, 250 U. S. 400, 430, which came here on error to a federal district court.

Third. Section 16, Art. III, of the Idaho Constitution provides—"Every act shall embrace but one subject and matters properly connected therewith, which subject shall be expressed in the title." Appellant contends that the act now under review contains two subjects, (a) the levy of a license tax on electrical energy generated in the state; and (b) a subsidy (§ 5) in favor of irrigation pumping users. The purpose of the constitutional provision, as this court said in *Posados* v. *Warner, B. & Co.*, 279 U. S. 340, 344, "is to prevent the inclusion of incongruous and unrelated matters in the same measure and to guard against inadvertence, stealth and fraud in legislation. . . . the courts disregard mere verbal inaccuracies, resolve doubts in favor of validity, and hold that, in order to warrant the setting aside of enactments for failure to comply with the rule, the violation must be substantial and plain." We cannot agree with the claim that the violation here is substantial and plain. The statute levies a license tax and creates an exemption therefrom in specified cases. This exemption, although it inures to the benefit of third persons, and whether it be constitutional or not, is obviously a matter properly connected with the subject matter of the act. It is nothing more than a limitation upon the generality of the tax. The supreme court of Idaho has laid down the proper rule in *Pioneer Irrigation Dist.* v. *Bradley*, 8 Idaho 310, to the effect that the purpose of the constitutional provision is to prevent the inclusion in title and act of two or more subjects diverse in their nature and having no necessary connection; but that if the provisions relate directly or indirectly to the same subject, have a natural connection therewith, and are not foreign to the subject expressed in the title, they may be united. Following this rule, we are of opinion that the objection is untenable.

It is further said that the subject of the act is not expressed in the title, since the title purports to levy a license tax on electricity and electrical energy generated, etc., for barter, sale or exchange, while the act requires payment of a tax upon such electricity and electrical energy generated, etc., in the state of Idaho for any purpose and measured at the place of production. The point made is that a tax on energy generated specifically for barter, sale or ex-

change, and a tax on all energy generated or produced in the state are entirely different things. The force of the contention depends upon the construction of the act. We are of opinion, as will appear more fully under the next heading, that the act, in harmony with the title, imposes a tax only upon the energy which is generated for barter, sale or exchange.

Fourth. Appellant contends that the act is so uncertain and ambiguous as to require arbitrary administrative action without a legislative standard, and thus take appellant's property without due process of law. The uncertainties said to exist are (1) that it cannot be determined whether the tax is levied on all electrical energy generated or produced, or only on such as is generated or produced for barter, sale or exchange; and (2) that if the latter be the true construction, the act affords no guide for the determination of what electrical energy in fact is generated for barter, sale or exchange; but by fixing the place and method of measurement it excludes the possibility of a determination of that matter. The same uncertainties are said to exist in respect of § 5.

We think the act is reasonably open to the construction that the tax is to be measured by the kilowatt hours generated or produced for barter, sale or exchange. The purpose, as manifested by the title, is to levy a tax "on electricity and electrical energy generated, manufactured or produced in the State of Idaho for barter, sale or exchange." The act itself in terms applies to those engaged in the production of electricity and electrical energy in the State of Idaho "for barter, sale or exchange." The producer is required to render a statement and pay a license "on all such electricity and electrical energy so generated, manufactured or produced, measured at the place of production." Considering these provisions and, in connection therewith, the title and the general scope and purpose of the act, the intent to impose the tax only in respect of energy generated for barter, sale or exchange is sufficiently clear.

The limitation of the tax to electrical energy generated only for barter, sale or exchange obviously requires that in determining the amount so generated there be excluded from the computation all electrical energy generated for other purposes. In other words, the intent of the act being to levy a tax only in respect of electrical energy generated for the purposes named, it becomes necessary, in order to effectuate the intention, to deduct from the amount

produced and measured at the generator such amounts as are generated for appellant's own use, or otherwise than for the specified purposes. We think this view is not precluded by the provision in § 1 of the act that the tax is levied in respect of the electrical energy generated, "measured at the place of production"; nor by the further provision in § 4 that the producer shall maintain at the point of production suitable appliances for measuring the electrical energy produced. Since the tax applies not to all electrical energy generated, and, therefore, not to all measured at the point of production, but only to such as is produced for barter, sale or exchange, it necessarily follows that other factors than the basic measurement at the generator must be taken into consideration. That is, to put the matter concretely, the amount of the initial production must first be ascertained by measurement at the place of production, and from that there must be taken amounts used by the producer or consumed in effecting transmission (including so-called line or system losses), or disposed of otherwise than by barter, sale or exchange—the remainder only being subject to the tax. The record shows that the ascertainment of these necessary factors is practicable, testimony being to the effect that the flow of energy passing any point in the transmission system, as well as the amount delivered at any point on the system, can be measured with fair accuracy if proper instruments be attached. Neither the validity of the tax nor its certainty is affected because it may be necessary to ascertain, as an element in the computation, the amounts delivered in another jurisdiction. See *American Mfg. Co.* v. *St. Louis*, 250 U. S. 459, 463; *Hope Gas Co.* v. *Hall*, *supra*.

It is said that the commissioner, who administers the act, has not provided for these deductions or the means for determining them. But the commissioner must administer the act as it is construed, and it is not to be supposed that he will not now properly do so. Undoubtedly, the administration of an act like this one is attended with some difficulty. Measurements and calculations are more or less complicated. Absolute precision in either probably cannot be attained; but that is so to a greater or less degree in respect of most taxing laws. If, for example, absolute exactness of determination in respect of net income, deductions, valuation, losses, obsolescence, depreciation, etc., were required in cases arising under the federal income tax law, it is safe to say

that the revenue from that source would be much curtailed. The law, which is said not to require impossibilities, must be satisfied, in many of its applications, with fair and reasonable approximations. Compare *Smith* v. *Illinois Bell Tel. Co.*, 282 U. S. 133, 150; *Story Parchment Co.* v. *Paterson Co.*, 282 U. S. 555, 563-566; *Commonwealth* v. *The People's Five Cents Savings Bank*, 87 Mass. 428, 436.

Decree affirmed.

A true copy.

Test:

Clerk, Supreme Court, U. S.